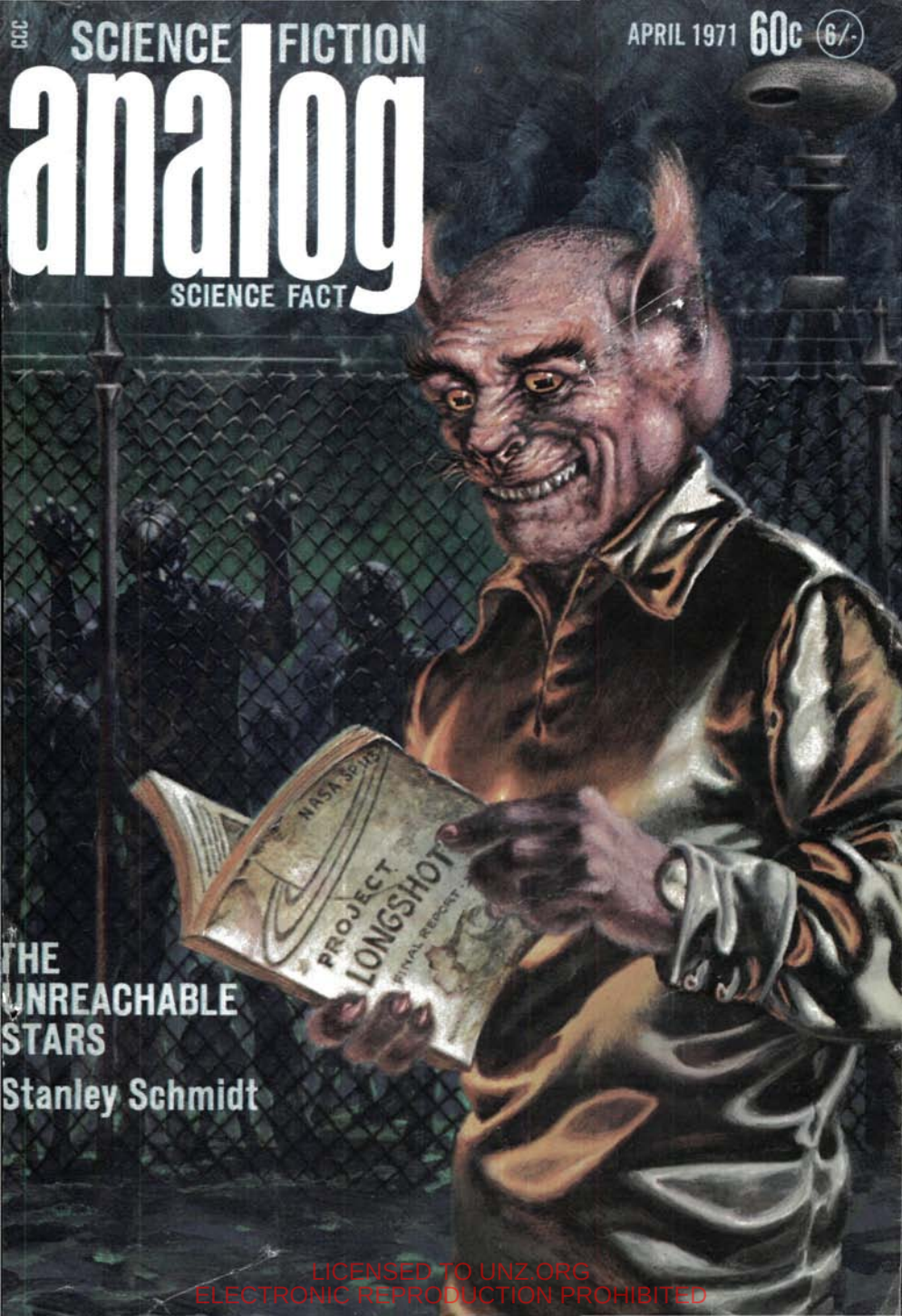

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NEXT ISSUE ON SALE
April 8, 1971
$6.00 per year
in the U.S.A.
60 cents per copy

Cover by
Kelly Freas

Vol. LXXXVII, No. 2 April 1971

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Analog Science Fiction/Science Fact is published monthly by The Condé Nast Publications Inc., 420 Lexington Avenue, New York, N. Y. 10017. Perry L. Ruston, President; Fred C. Thormann, Treasurer; Mary E. Campbell, Secretary. Second class postage paid at New York, N. Y. and at additional mailing offices. Subscriptions in U.S. possessions and Canada, $6 for one year, $10 for two years, $13 for three years. Elsewhere, $8 for one year, $16 for two years. Payable in advance. Single copies in U.S. possessions and Canada, 60¢. For subscriptions, address changes and adjustments, write to Analog Science Fiction/Science Fact, Box 5205, Boulder, Colorado 80302. Six weeks are required for change of address. The editorial contents have not been published before are protected by copyright and cannot be reprinted without the publisher's permission. All stories in this magazine are fiction. No actual persons are designated by name or character. Any similarity is coincidental. We do not accept responsibility for unsolicited manuscripts or art work. Any material submitted must include return postage.

POSTMASTER: SEND FORM 3579 to ANALOG SCIENCE FICTION/SCIENCE FACT, BOX 5205, BOULDER, COLORADO 80302

Editorial and Advertising offices: 420 Lexington Avenue, New York, N. Y. 10017

Subscriptions: Analog Science Fiction/Science Fact, Box 5205, Boulder, Colorado 80302

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ECOLOGICAL COLLAPSE

an editorial by
JOHN W. CAMPBELL

Ecological disaster is usually the result of the "bloom," or population explosion, of one, or a small group of related organisms. The current ecological turmoil results specifically from the "bloom" of the organism *homo sapiens;* it is the result of the by-products of a living organism that is undergoing a major population explosion.

The population explosion of *homo sapiens* is not the first explosion of one organism, nor by any means the most devastating; each such explosion normally produces its devastating results by reason of its metabolic by-products—and in this connection, one must recognize that cities and high-level technology are as much a natural metabolic by-product of *h. sap.* as dams are the natural by-product of beaver metabolism. Beavers also have a profound effect on the ecology of a region where they establish a population; their by-products turn streams into ponds, which become marshes, and convert the area to an entirely different ecological balance.

The most terrible ecological disaster of all time, however, was immensely more massive than anything Man seems likely to achieve. This truly great ecological collapse resulted from the bloom of a new class of organism which gave off, as a major metabolic by-product, a violently corrosive, viciously poisonous substance which literally destroyed almost every other living thing on the planet. So viciously corrosive is that by-product that it not only destroyed almost all life on the planet, it even tore down mountain ranges, corroded the rocks, and poisoned the atmosphere so thoroughly that a major portion of the sun's rays have never since been able to reach Earth's surface.

Typical of a biological bloom, the whole ecological disaster took a geological instant—probably something like 1,000 years.

Yet so tough is a biological system that here and there, one way and another, enough individual resistant forms somehow survived even the attacks of the universe's most destructive, corrosive poison to rebuild an entire new ecology based on the

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very toxin that had almost cleaned the planet of other life!

That most deadly and corrosive substance is, of course, oxygen; the fact that we, who are descendants of the somehow-survivors, find it not only nonpoisonous but necessary to life has nothing to do with its toxic qualities. It corroded Earth's mountains, for Earth, until that immense bloom of photosynthetic organisms, had a reducing atmosphere—an atmosphere of hydrogen, methane and ammonia. Add oxygen to that mixture, and the hydrogen becomes water, the methane carbon dioxide and water, and the ammonia free nitrogen and water.

Now while fluorine is a somewhat more vicious corrosive than oxygen, fluorine and water cannot coexist. Hydrogen fluoride and fluorine are not nearly as corrosive as oxygen and water—because hydrogen fluoride, unlike water, is very weakly polar. Water has two hydrogens which cannot find a completely balanced relationship with oxygen; this gives water extremely powerful ionic solvent properties, and some highly unusual physical-chemical properties, such as the tendency to expand on freezing.

Water does a great job of dissolving practically anything—and what it can't dissolve, under the influence of Earth's climate, it can pry apart and reduce to silt.

Meanwhile, a secondary effect of that metabolic by-product was a photochemical reaction—somewhat like the photochemical reactions of automobile exhaust that yield extremely toxic compounds under the sun's ultraviolet radiation. Oxygen which made its way into the outer layers of Earth's atmosphere—after all the methane, hydrogen and ammonia had been destroyed by oxidation reactions—underwent a photochemical reaction yielding ozone. Between them, oxygen, O_2, and ozone, O_3, form a layer of jet-black gas blanketing the entire Earth. It's black not in the visual region, of course, but in the wide band of ultraviolet just beyond the visible.

The "visible" region of the spectrum is, of course, the relatively narrow band of radiation to which all our atmospheric gases are most remarkably transparent. Just realize that a layer of those gases some 100 miles deep absorbs so little of the radiation in that band that we can see the minute amounts of energy reaching us from stars millions of light-years distant. Man, it's *really* transparent!

And that, obviously, is why it *is* "visible" radiation. It would be utterly useless for organisms evolving on this planet to have eyes sensitive to ultraviolet radiation; practically speaking, there is *no* ultraviolet illumination on Earth's surface.

Of course, the introduction of that immensely corrosive gas into the atmosphere and hydrosphere of the planet meant death to all the trillions of organisms that had evolved over preceding megayears in a fairly

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stable H_2-CH_4-NH_3 atmosphere. Not only had they lost the strongly alkaline conditions they depended on, but the seas had been turned acidic by the carbon dioxide that replaced the ammonia—and deadly oxygen had been added.

Rocks that were stable in a reducing atmosphere underwent oxidation—with resultant changes in crystalline form that crumbled away mountain ranges.

But a biosphere is far tougher than it at first appears; despite even so appallingly drastic a change of conditions as then occurred—from alkaline-reducing to acidic-oxidizing!—some scattered organisms here and there somehow managed to survive by equally drastic mutations and modifications.

Today, the nuclei of your cells contain substances—like *deoxy*ribonucleic acids—that are not stable in an oxidizing medium; they're surrounded by and protected from free oxygen by cytoplasm and cell-wall materials that allow them to retain the ancient reducing-atmosphere characteristics even in an oxygen-saturated world.

Of course, those few cells that did manage to survive the immense ecological disaster found themselves in a world full of dead organic material for food, and an unlimited opportunity to grow and expand. They had essentially no competition for space or nutrients. And those that learned how to *use* the cause of the awesome disaster, the very oxygen that had poisoned all the world, had a new and immense advantage! Using free oxygen as an oxidizing reagent for energy production, instead of having to use the oxygen from water, they could get some 30 times as much net energy output from a given quantity of food.

And, as I say, the world was full of organic food—all the millions and millions of tons of reducing-alkaline cells that hadn't been able to survive.

That was, beyond doubt, the greatest environmental pollution that ever occurred. A more complete ecological collapse could hardly have been imagined.

The thing to note and appreciate deeply, however, is that *ecology survived*, even if *that* ecology was totally annihilated.

No more disastrous pollution could be imagined; an organism that bloomed stupendously, unchecked by shortage of available organic food energy, as all other organisms had been, and released the most deadly imaginable pollutant in such stupendous amounts that the geology of the planet itself was forced into new lines.

Be it remembered that none of the works of Man can be detected in photographs taken from 150-mile elevations—they're totally lost in the works of photosynthetic organisms, the world-covering plants, and the works of their dependants, the coral-building animals. The vastest dams, or buildings, or highways Man ever built don't begin to match the im-

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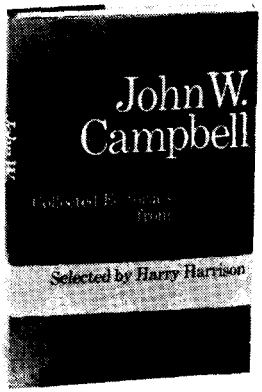

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mensity of the Great Barrier Reef.

The bloom of an organism is not the only thing that can bring on a major ecological collapse. Astrophysicists have calculated that, from the normal frequency of occurrence of supernovae in the Galaxy, and from the normal movement of the Solar System around the gravitational center of the Galaxy, the Solar System must, on several occasions, have passed relatively close to an exploding supernova. The light and heat radiated by an exploding giant star, even as close as two light-years, would not be particularly bothersome—unusually warm summer perhaps in one hemisphere, and an unusually mild winter in the other—possibly brighter-than-usual nights (depending on whether the supernova was in conjunction with the sun or opposition) but nothing very noticeable.

But the immense flood of extremely hard radiation, both gamma rays and high-energy particle radiation—would be a very different thing. The Earth would be treated to a dose of radiation from a super-super-unimaginable-nuclear bomb. At a distance of a few light-years, the hard radiation reaching Earth would sterilize the surface of the planet—kill every living thing not protected by a thick blanket of absorbing matter. And that means something like

continued on page 174

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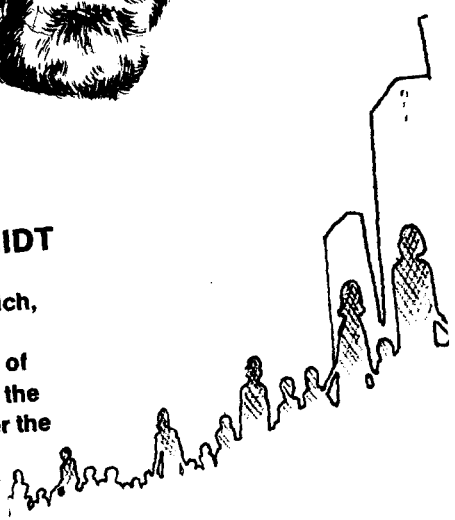
STANLEY SCHMIDT
ILLUSTRATED BY KELLY FREAS

There are choices which, once made, can't be reversed—and typical of these is the choice of the immediate desire over the long-time need!



THE UNREACHABLE STARS

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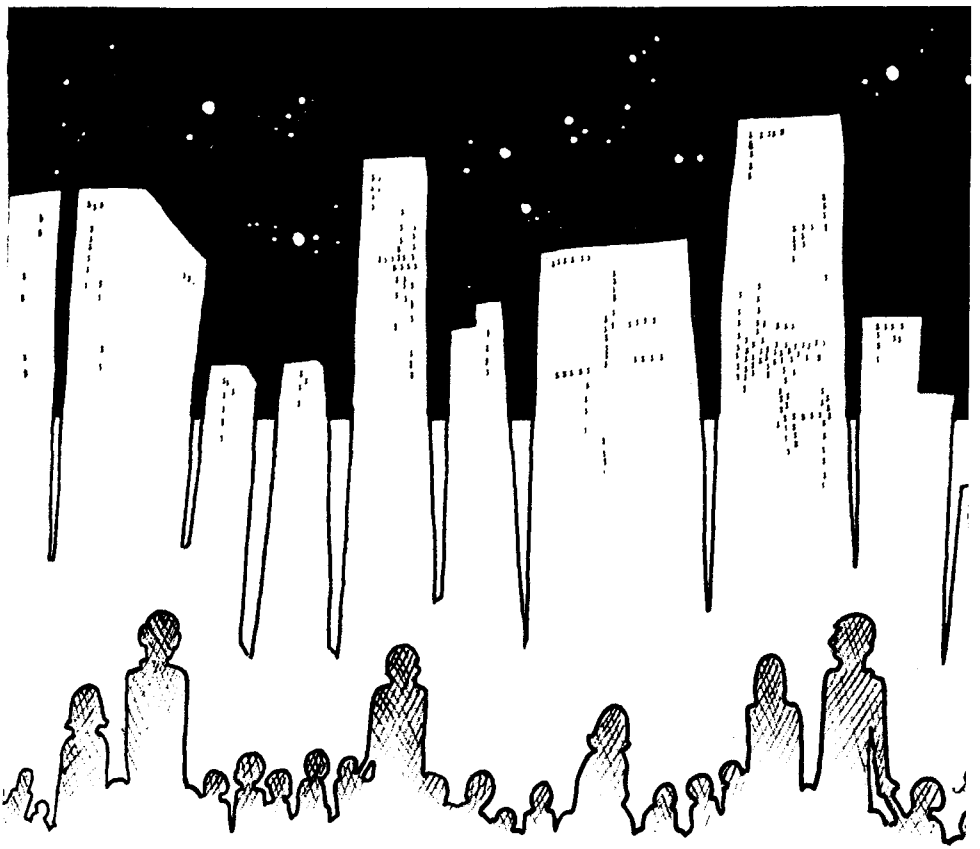

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Anthon Hillar could not quite get over his awe at the luxuriousness of the Regional Planning Director's office—and at the security measures which the government seemed to consider necessary. The director, a man of abnormally healthy and well-fed appearance, sat behind a massive desk with a row of lights spelling out "Olaf Karper" and stared at Anthon with an expression of mild amusement. But he stared by means of a closed-circuit television system, as if afraid to expose himself to the actual presence of a common person. And Anthon suddenly realized from the expression on the bureaucrat's face that he was not being taken at all seriously. "Well, then," he asked, suddenly defensive, "may I presume to ask what *you* think the stars are?"

Karper flashed a sardonic grin, apparently meant for someone out of view in his inner office. "I don't waste a great deal of thought on them," he confessed with a shrug. "I suppose they're what the nursery rhymes say—globs of fire, or something, somewhere off in the sky. So what? Hardly matters to command much of the attention of a busy administrator here on Earth."

"But they *are*!" Anthon insisted, leaning earnestly forward in the uncomfortable straight chair provided for visitors. "If these books I've found are right, they may be very important indeed. If they really are like other suns, pouring light and heat on other planets like Earth—or like Earth used to be—and if we can find ways to send people there . . ." He saw how little impression he was making on the Regional Director and his voice sagged as he finished, "They could provide some relief. At the very least a fresh chance for a few people . . ."

He gave up. And when Karper spoke he didn't even mention the soaring idea Anthon had been trying to get across. He just said, "About those books of yours, young man. Where did you say you found them?"

Anthon sighed impatiently. "One of the new energy-and-food complexes in Kaliforn," he repeated. "I already told you, I was supervising a construction group tearing up a historical preserve to make room. We were in an old burial region and we hit an unusually large, elaborate tomb. Some rich Twenty-first Century eccentric or something; I don't know. But it contained a lot of relics of the age—including books and papers. Our machines broke an outer chamber and we found the ones I told you about. There may be more. But the rest of the vault is stronger. We'll need special equipment to open it without damaging any other artifacts that may—"

"And you came straight to me to ask for this special help," Karper interrupted, "rather than going to your immediate supervisor?"

"Yes. The issue seemed too important—"

"Hm-m-m! Proper channels are provided to be properly gone

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through, young man. Your supervisor can hardly be expected to like your bypassing him. I don't like it either. And I don't know *how* you bluffed and bullied your way past my secretaries." He paused, shaking his head and meditatively chewing a fingernail. "You thought it was too important," he repeated finally. "Now how on Earth did you decide that?"

"As soon as I saw what the books were about—"

Karper's eyebrows shot up in mock astonishment. "And how did you do that? You read Ancient English?"

"I told you," Anthon snapped, increasingly tired of repeating himself in circles, "I showed them to a friend. A professor of Ancient English in a Government School—"

"Who?"

"Mylo Gotfry. I told you that, too." Anthon suddenly felt—for the first time—an unaccustomed qualm. Had it been wise, he wondered, to mention Gotfry's name?

"Odd," Karper mused, again chewing his fingernail, "that a construction worker should be so friendly with a scholar. Can you explain that to me?"

"I can," Anthon said, his exasperation rising dangerously, "but what difference does it make? You keep harping on these petty things about me and ignoring what I came about. There's a pile of lost knowledge preserved out there and I want to be sure we get it out safely. Don't you care at all about that? Wouldn't you even like to find out if the stars *might* offer some kind of a way out?"

"Frankly," Karper muttered with obvious irritation, "I think this whole notion of other suns and planets is hogwash—and that goes double for the idea of people going to such places. But—" Abruptly his manner became suave, ingratiating . . . patronizing. Making quite a show of it, he produced a writing pad on which Anthon saw but could not quite read a couple of scrawled words, and prepared to write some more. "If it will make you feel better, why don't you tell me exactly how to find this vault of yours, and I'll see that proper action is taken."

Anthon stared distastefully at the director's face for a long time, feeling a growing—and frightening—realization that "proper action" was not what he wanted. "Forget it," he said curtly, and as he said the words he rose from the chair, not allowing himself time to reconsider, and strode hastily from the room.

"Well, can you beat that!" Karper blinked in astonishment as Anthon Hillar's back disappeared through the door on his phonescreen.

"Do you want me to have him stopped before he leaves the building?" his secretary asked, reaching for call buttons.

"No." Karper shook his head absently. "The man's a crackpot, obviously. Not worth any more of our time." But as the secretary left and

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Karper tried to get back to what he had been doing before the interruption, his thoughts kept returning to the strange young construction worker. There were things about his story . . .

Karper couldn't be sure, of course. Such things were not included in his training. But the wild ideas Hillar claimed to have unearthed sounded vaguely subversive. It obviously would not do to have rumors spreading that there was a way out—when, of course, there wasn't.

And if, by any farfetched chance, there actually *was* anything to the ideas . . . if, impossible as it seemed, there *was* a way out—

In either case, Hillar should be in custody, and his vault should be found and opened under strictest security. And that scholar—Gotfry—who had already seen some of the books . . .

Softly cursing his blunder in letting Hillar walk away so easily, Karper hurriedly punched buttons on his phonescreen and waited for a connection. When an image finally formed on the screen, he saluted it quickly and said, "Sir, something's come up and I need your advice. The man left my office just minutes ago and he can't have gone far . . ."

Karper was quite right that Anthon had not, at that moment, gone far— in terms of distance. But it took little time or effort for a man to effectively lose himself in the city's throngs.

And that was exactly what Anthon intended to do.

He had no plans yet. His decision had come suddenly and surprised him as much as Karper, and he had not yet considered what he would do next. It had just suddenly seemed clear that the ideas from the tomb were more likely to be reburied than revived by Karper and his fellow bureaucrats. And Anthon felt that they were much too important for that.

So he had left. Unceremoniously, but probably not in such a way as to prompt any immediate punitive action.

Still, there was no point in taking unnecessary risks. So as soon as he left the government building, he merged into the dense crowd jamming the street and threaded a zigzag course away from the building, moving fast but trying to avoid an appearance of suspicious haste. Blending in was easy—the crowd contained such a multitude of so many nondescript types that it was hard to follow any individual through it for long.

Not far away, the crowd thinned somewhat and the broad boulevard splintered into narrow streets penetrating the deep, dingy canyons of a residential district. Here Anthon felt slightly more conspicuous. Every few steps, beggars held their cups out and stared pointedly at him. He hurried on past them, past the thin hungry people who were everywhere, past the shabby rows of crowded apartments where they lived and

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died and watched blaring television sets. The day was hot, even at its end, and air-conditioners poured excess heat into the street all along both sides. Anthon felt uncomfortable here--crime was commonplace, and the drugged and sick and mendicant had all become more numerous even within his own memory. And why not? Every man, woman, and child received a "fair share" of food and energy--but every year the fair share was a little smaller. Naturally more people would try to supplement theirs--or give up.

And when Anthon thought of Olaf Karper's round ruddy face and plush office against this background, he smelled a rat in the rationing process.

He was shaking as he reached the East 367th Street transport exchange and hurried down the ramp to the tunnels. The crowd circulated here, too, jostling for space on the moving standee strips of the intracity group and the enclosed trains of the Express system. Small private vehicles whizzed by in the Open lanes, and beggars sat cross-legged in reserved places along the walls. Anthon fought his way to a Seaward Express platform and got onto the second train. There were no seats, so he stood, gripping an overhead rail, as the train lurched forward into the dark tube. Looking straight ahead, he thought dazedly, *All Earth is like this! And it wasn't always . . .*

The train hummed quietly for a few minutes, then lurched to a stop and waited as its passengers streamed to the exits. Anthon streamed with them, across the platform interchange and up to street level.

The smell of the sea was in the air here--though largely masked by the smells of the city--and things were a bit quieter. Anthon relaxed slightly. He was miles from Karper's office now, and almost certainly free of pursuers--unless Karper had taken his story much more to heart than Anthon believed likely. That meant he could now begin giving some real thought to his own actions.

He entered the continuous row of buildings that hid the beach from the street. There would be food dispensers and tables off a lobby, and it would be easier to think on a less empty stomach.

He found the machines with little effort. The room was half empty, and over the general chatter Anthon easily heard an enraged patrolman in the corner lecturing an embarrassed ten-year-old on how he must never, *ever* throw glass in the aluminum slot on the recycling terminal. But it barely registered on his mind--he had heard it before, and the offense was one he would never think of committing himself. He stuck his ration plate in a food dispenser, made his selection, and let his mind settle onto his own affairs.

He stood alone at an empty table to eat his meal and ponder his situation. What had got into him, any-

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way? Fired by the ideas Mylo had found in the old books and papers, he had gone to Karper with grandiose but vague ideas of acting on them. True, he *had* bypassed his supervisor—but it had seemed necessary at the time.

And then the interview with Karper had proved so fruitless that he had impulsively walked out in the middle of it. A nearly unthinkable breach of etiquette, he realized now, and as such probably a mistake—but not a crime.

And for that reason he almost certainly had no cause to expect trouble from that quarter.

But now he faced decisions. His idea, when he left, had been that he might do something on his own.

A vague idea—just like the ones that had taken him to Karper in the first place. The words from the tomb—fragile paper books imperfectly preserved in the sealed darkness, loose sheets coated with clear plastic—had tickled his imagination with the idea that there were other worlds and men might reach them. But they had told him nothing of *how*. And he knew so little.

Frustrated, but determined not to be unnerved by it, he finished his meal and went to the rear of a lower level. A service corridor led him outside on the sea side of the building, and he sat down on the narrow seawall with his feet dangling high above the breaking surf. It was one of the few places he knew where he could find a semblance of solitude.

It was getting dark. The rows upon rows of window lights in the building at his back danced in constantly shifting reflections on the dark water that stretched to the horizon.

And above them, in the sky, other points of light twinkled from fixed locations—the stars, whatever they were. Anthon could see nearly a dozen, and the old book said there were really thousands that could be seen where there was no city glow. Anthon tried to picture that, and failed.

But if there were . . .

And there was the moon, now a bright crescent low in the west. The closest of all other worlds, according to the books, and a desolate place not fit for living.

Yet, if the plastic sheets did not lie, the ancients had *walked* there!

Looking at the sky and remembering what Mylo had read to him, Anthon felt the same excitement that had sent him to Karper welling up again. Exotic names haunted him.

Where *was* Cape Kendy?

Then he remembered how little he knew and the excitement collapsed in a limp heap. *I don't know where to begin,* he thought bluntly. *Face it. I might as well go back to work in the morning and forget all this. But it was a nice dream.*

He stood up abruptly, jerking his eyes away from the sky, and turned back to the door to the building. *Maybe,* he thought savagely, defensively, *those papers were just a hoax anyway . . .*

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He started inside—and stopped in midstride as a voice spoke inside his head. "No," it said quietly but distinctly—and Anthon knew it was coming from somewhere else, "they're no hoax."

Ozrlag looked up as soon as he had thought it and saw Mizhjar standing in the doorway, glaring sternly and flicking his forked tail slowly from side to side. Flustered, trying to move his four-fingered paw as inconspicuously as possible, he shut off the transmitter and looked sheepishly at Mizhjar, waiting. "Hello," he said finally, weakly.

Mizhjar blinked his nictitating membranes indifferently. "Just what," he asked grimly, "do you think you were doing just now?"

"I . . ." Ozrlag began uncertainly.

"Never mind," Mizhjar interrupted, snapping his tail impatiently. "I know what you were doing. The question is *why*?" He strode toward Ozrlag, powerful muscles rippling under his soft pink down, and stood looking ominously down at his seated apprentice. "Don't you realize that people are *trying* to observe a culture in its natural state down there?"

"Yes, sir," Ozrlag gulped—or at least did what would correspond to gulping among the jömür. "But . . ." He had already started to recover from the shock of discovery by his adviser, and already he was preparing to attempt a defense. "This Anthon is special. We'd been studying this culture for seven seasons before we noticed him, and how far did we get? All we knew was that it was anomalous—a subsistence economy with a high-level technology. Nuclear power in full swing—though apparently frozen at the breeder reactor stage—and a vast population on the brink of starvation. Weird. Paradoxical. But *how did it get that way*? We had big teams scanning local archives through native minds and finding no clues. There seemed to be a big gap in their records, as if they had no interest in history. What Anthon found seems likely to start filling the gap."

"And we already have a group concentrating on what Anthon found," Mizhjar pointed out, "through Mylo Gotfry. You still haven't said anything to explain your arrogance in making a direct contact."

"Anthon thinks there's more where that came from," Ozrlag said. "He tried to get special help to get at it—because he's interested in the space-travel concept, which he seems never to have met before. Just now he was about to give up—and that would cost us access to this new information. So I thought it would be to our advantage to prod him a little." Ozrlag paused, looking expectantly at Mizhjar, then added defensively, "Look, I didn't give us away. I just made one little comment, as an anonymous mental voice. He could interpret it as his own conscience, or divine in-

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spiration, or whatever's fashionable this season."

The expression on Mizhjar's feline face softened slightly, to Ozrlag's considerable relief. "I'll grant," he said, just a bit grudgingly, "that we'd all like to know what's in the other documents—if there *are* any other documents. But I'm still not sure you chose the wisest way to try to get at them. And look here." He motioned vaguely at the monitor panel—a panel which, like most on board the orbiting ship, would have struck a human visitor as oddly blank. But that was simply because most of the instrument readouts were directly telepathic, and Mizhjar's apparently random gesture directed Ozrlag unerringly to the intended item. "This ruler type that Anthon went to—Karper—is *not* going to help him help us. But it looks like Anthon's request unsettled him quite a bit, and the government's going to go after whatever other documents there are on its own."

Ozrlag hadn't noticed that before, but it was obvious now. Less obvious were the reasons. He started to comment, but before he started, Mizhjar continued.

"Just what they intend isn't clear—anyway to me. I don't think they're sure themselves, yet. But there's a good possibility that they'll destroy that material, or at least impound it, rather than trying to read it. So it behooves us to get there first—with somebody who wants to read it."

"Anthon?" Ozrlag asked, startled.

Mizhjar nodded. "Yes. And he might be reluctant, in his present mood."

"So," Ozrlag said slowly, hardly believing Mizhjar had come around to this in these few minutes, "I can keep talking to him?"

"I'm afraid you'll have to," Mizhjar said with obvious reluctance. "But, please . . . try to be discreet."

Anthon's first reaction to the voice in his head was puzzlement—and a bit of concern for his own mental health, since he had never been subject to hallucinations. He paused, just outside the door, and listened intently. But all he heard was the sea pounding the wall behind him, and the soft hum of the building's service machinery.

He shrugged and entered the building, shoving the imagined voice into the back of his mind. Resigned to the futility of what he had hoped to do, he headed back toward the street and the transport exchange. He would go home and count this day lost; tomorrow he would return to his job, take whatever minor punishment was coming to him, and then live out his days as he had always expected to.

The train was purring through its black tunnel, its few passengers reflected brightly in the small windows, when Anthon heard the silent voice again. "Giving up?" it chided gently. "With so much at stake? A fresh chance, and you pass it up?"

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It was too distinct to ignore. Anthon grudgingly acknowledged its reality and tried to think rationally about it. Either it was a trick his own mind was playing on him, or *somebody* was somehow communicating directly with him. Anthon had heard folk tales of such communication. He had never believed them, but he was not one to dismiss possibilities without even a cursory examination.

He glanced around to make sure no other passengers were close. Then he whispered, "Who are you?"

He listened—if that is the right word. But no answer came.

Several seconds passed with no sound but the hum of the train and faint laughter from the far end of the car.

Then the "voice" came again, cool and with no indication of having heard Anthon's question. "The stars, Anthon, the stars!" it said. "Are you going to let them slip through your fingers? Aren't you going to *try* to get the other documents from the tomb?"

"The stars," Anthon muttered, quoting Karper, "are hogwash."

"No, Anthon," the voice insisted. "The stars are real. And they have new worlds—"

"How do *you* know?" Anthon snapped.

No answer.

Anthon waited. Then, "Whoever you are—can you hear me?"

Silence. Just the hum of the train.

Anthon shrugged. *O.K.,* he thought, annoyed. *So maybe I don't know how to talk back so he can hear me. Or maybe it* is *just a hallucination.*

Either way, he didn't like it.

The train screeched into the exchange nearest his home and he got off. Without further delay, the train streaked noisily out of sight while Anthon crossed the platform interchange—cautiously, for transport exchanges attracted thugs at night—and caught a lift to his street.

The street, like most residentials, was a narrow canyon between high-row dwellings, still sweltering in the exhaust of a thousand air-conditioners even this late at night. A few bright stars hung in the narrow slice of sky between roof fronts and shimmered in the turbulent air.

And Anthon felt haunted. He no longer heard the voice—although occasionally he seemed to catch a wisp of something so faint he couldn't be sure it was real—but the questions it had raised were again churning in his mind. He had thought the issue was closed—and now, whether the voice was real or imagined, it was tormenting him again.

Suppose, he thought, *the stars* are *real. Then you* are *throwing something big away. Can you do that and live with yourself?*

What can I do? another part of his mind countered. *I don't know where to begin.*

You begin, came the reply—and Anthon wondered idly if this dialogue was all in his own mind or if that voice was actually helping—

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with the tomb. All the documents—

And suddenly Anthon's mind pulled together into a unit again as he realized the magnitude of what he had just thought. Of course that was the place to begin! His attempt to get at whatever was still in the tomb had failed—but they had barely scratched the surface of what Mylo already had. Possibly *that* contained a key.

For a fleeting instant, Anthon wondered about the tomb itself. While he had heard of such elaborate burials before, with artifacts preserved along with the body, he knew they were not usual in any part of the Twenty-first Century. What sort of man had had himself buried so oddly, with a library he could never read again—and why?

Had he, Anthon wondered abruptly, been trying to tell those who followed him something?

Then the thought passed and Anthon filled with new determination. He paused at the door of his own apartment and turned his new plan over once in his mind, examining it. He would go back to Mylo and learn all he could from the documents already in hand. And then, armed with that knowledge, he could better seek whatever else he needed to restore the lost arts.

Maybe, he thought jauntily as he turned away from his unopened door and started back to the street, *I'll even go find Cape Kendy myself!*

Ozrlag saw Anthon's decision and swore—and among the jömür, profanity is a highly developed and highly regarded art form. Reluctantly, he summoned Mizhjar.

Mizhjar's first words, when he arrived, were, "*Now* what have you done?"

"Please!" Ozrlag winced. "Must you always assume I've botched something? It's just that . . . well, my attempts to goad Anthon into going back after whatever documents are still in that tomb aren't working quite according to plan. I've got him interested in space travel again—but now he fancies himself as some sort of savior of his people." Mizhjar's whiskers curled questioningly and Ozrlag explained, "That is, he sees space travel as a way out of their domestic problems, and since the government doesn't seem interested, he wants to learn about it himself. He's going back to Mylo Gotfry to get started."

"Ridiculous!" Mizhjar snarled.

"Of course," Ozrlag agreed. "But even more importantly, a wasteful duplication of effort. We already have historians and comparative scientists scanning that material through Gotfry. Anthon isn't going to do a thing for us there. And meanwhile he's doing nothing to keep Karper from grabbing whatever new stuff there is out from under our noses."

Mizhjar nodded slightly. "What are you leading up to, Ozrlag?"

"I tried to obey your instructions to be discreet," said Ozrlag, "and this is where it got me. I couldn't be ex-

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plicit enough. All I could do was prod him to follow his own inclinations—and they led him in a direction just different enough from what we had in mind to be utterly useless to us. Considering the possible importance of new documents to our cultural studies, I wondered if you would consider it wise to let him in on a little secret. If he knew who we are and what we want, and saw the possibility of mutual benefit—"

"*No!*" Mizhjar's tufted ears snapped erect and he broke in without waiting for Ozrlag to finish. He was obviously not at all amused. "That sort of thing is *strictly* a last resort. I can imagine circumstances in which you'd have no choice—but things haven't got that bad yet. Keep applying the same kind of pressure you've been using, but slant it toward getting at the new information before it's lost. You can do that, can't you? Play on this obsession of his. Use it to our advantage. And don't disillusion him too soon. You understand?"

Ozrlag, approximately speaking, sighed. "Yes, sir. I'll do my best."

Mylo Gotfry now lived, as befitted one entrusted with the education of future government officials, in a well-appointed penthouse among the foothills two hundred miles from Anthon's home. It was midday when Anthon stepped off the last strip and looked quickly around, less to marvel at the tiered expanse of rooftops stretching down into the valley and up the neighboring hills than to detect any signs of possible personal danger. It felt rather silly, almost paranoid—but the fact was that he had now been away from work without authorization for several hours, and that sort of thing simply isn't done. He *would* be hunted, and though he was far from home, Karper knew of his association with Mylo. He did not dare feel safe here.

Feeling a completely unaccustomed apprehensiveness—he had never been a fugitive before—he entered the building. He scanned the door-lined corridor furtively from the end before entering it, and when a lift stopped for him he watched the door open from a hidden alcove across the hall to be sure the car was empty.

His tensest moment came when the lift discharged him into a glassed-in vestibule on the roof. There was virtually no cover here, Anthon realized uncomfortably—no place to hide if they happened to trace him here.

But they were not here now, and things improved slightly in the corridor that served all the rooftop apartments. It was all glassed in, like the vestibule where the lift came up, to give the tenants the illusion of being outside without the annoyance of being rained on. But the immediate neighborhoods of many of the apartments were decorated by artificial shrubbery to heighten the illusion—rather sparse, but better than nothing.

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Breathing only a little easier, Anthon reached Mylo's door and stopped. He put his ear to the door, listening for voices other than Mylo's, but heard nothing.

He knocked.

As he waited, he mulled over his solidifying plans, feeling growing confidence. Sure, the other worlds were far away—that was obvious from their appearance as tiny spots in the sky. Of course they wouldn't be able to absorb enough people to relieve the crowding on Earth. But that crowding had grown so bad that increasing numbers found local conditions intolerable—and Anthon was sometimes plagued by doubts about how long such a civilization could survive at all. If it didn't—or even if it just remained as it was—it seemed increasingly desirable to give even a few people a chance to try again, to start fresh on an unspoiled world and avoid the mistakes of their ancestors.

Their ancestors had been on the way to achieving that possibility—and, apparently, had abandoned the attempt. Anthon had no idea why, but he had found a way to learn what they had known and try to build on it. His mistake had been going to Karper prematurely—before he had thought it out to the point where he could offer more than vague conjecture. But after he had studied the documents Mylo had here, he would be able to offer concrete suggestions. And Mylo was, in his way, a rather influential man . . .

Meanwhile, Mylo was also a clever man. Clever enough to help Anthon stay out of sight while he studied the old books and papers.

Anthon realized with a start that he had been standing here letting his thoughts wander for a long time, and Mylo had not answered. He knocked again.

Again a long silence. This time Anthon's thoughts focused on a question: What was wrong in there?

He didn't knock again. He stepped behind the artificial shrubs and stood under the window, small and set high in the wall to insure privacy while letting sunlight in. Hooking his hands over the narrow sill, he hauled himself up and rested his weight on his forearms while he looked inside.

Mylo was there, right across the room, but Anthon had never seen him like this before. He sat at a table, the ancient volumes piled before him, his bald head tilted toward Anthon and glistening with sweat. He didn't look up—his eyes never left the tattered volume he held open in front of him. He was flipping through the pages, in order and quite methodically, but so fast that he couldn't possibly be actually reading them.

With growing alarm, Anthon rapped on the windowpane.

Mylo didn't even look up. He kept flipping through the pages as if he had not heard Anthon.

Anthon dropped to the roof. Something was very wrong—and very strange—with Mylo. And An-

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thon wasn't at all sure what he should try to do about it. Should he break in—or leave as fast as he could?

He was about to decide on breaking in when that "voice" returned, and this time there was a commanding sense of urgency in it. *"Anthon! Hide—right now!"*

The tone was so compelling that Anthon was stretched flat on the roof, between the wall and the shrubs, before he even thought of questioning it. And then when he started to think about what he had done, he heard footsteps coming up the corridor from the lift.

He froze, waiting, breathing as lightly as he could. The footsteps passed right by him, separated from him only by the thin plastic plants, and then he saw four male feet turn and stop at Mylo's door. Lying very still, he rolled his eyes upward. He could see their faces now, and if they happened to look this way they would see him, too.

One of them was Olaf Karper. The other Anthon didn't recognize, but he was tall and rugged, with a craggy face and brilliant red hair, and he wore a government suit.

Karper knocked on Mylo's door. He and the stranger waited silently for half a minute, then he knocked again.

This time a full minute passed. Then Karper looked up at the stranger and said, "He doesn't answer, sir. I have no idea why he should suspect anything—unless Hillar came here and warned him. Do I have your permission to break the door down?"

Anthon frowned—or would have, had he dared to allow himself that luxury. Karper made it sound as if they were looking for Mylo, instead of Anthon.

The stranger nodded. "Go ahead, Olaf."

Karper drew back a step from the door and took a small metal instrument from a deep pocket. He made an adjustment on it, then pointed it at the lock and seemed to brace himself.

At the anticlimactic sound of a latch turning inside, Karper lowered his instrument. Anthon heard the door open and Mylo appeared, looking pale, dazed, and disoriented. "What is it?" he asked, his voice weak and tired. Anthon felt slightly relieved, but there was still much that needed explaining.

The tall redhead flashed a card at Mylo. "Mylo Gotfry? Artu Landen, Senior Security. You know a chap named Anthon Hillar?"

Mylo frowned slightly. He looked as if he were gradually getting his bearings back. "I do," he said. "Why?"

"He brought you some books—old books, to translate. We want those."

"I don't understand. They're just—"

"Don't argue. They're suspected of conflict with the people's interest. Here's my warrant. Now, the books, please."

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Mylo read the warrant carefully, slowly, then turned without a word and disappeared into the apartment, leaving the door open. He reappeared shortly, carrying the pile from the table.

Security Officer Landen looked at them. "Old, all right," he muttered."Are these all?"

"Yes." Mylo added no title of respect.

Landen hesitated briefly, then nodded to Karper. "Better make sure he didn't forget any, Olaf." Karper squeezed through the door past Mylo. While he waited, Landen lifted a book off the top and thumbed curiously through it, shaking his head. Then he took several books off the pile and tucked them under his arm.

Karper came back out and reported, "That seems to be all of them, sir."

Landen smiled slightly and nodded at the books Mylo still held. "Good. Get the rest, will you, Olaf?" Then, to Mylo, "Gotfry, you know as well as I that this sort of work is to be done only under official supervision. I won't take any action against you this time, but I'd advise you to steer clear of unauthorized moonlighting in the future." He turned without waiting for an answer and started briskly back to the lift, closely followed by Karper and the rest of the books.

Mylo looked after them for no more than a second, then turned, looking vaguely puzzled, and went back inside and shut the door. Anthon lay still, waiting to be sure Landen and Karper were really gone, and tried to make sense out of what had just happened. They hadn't been interested in Mylo after all, it seemed. Apparently they weren't even very concerned about Anthon. Instead, they wanted the books—and Artu Landen was Senior Security! Why would anybody that high suddenly care about those books—while ignoring a construction supervisor absent without leave?

After what seemed a reasonable time, Anthon cautiously stuck his head out between the shrubs and looked down toward the lift. It looked safe. He stood up and started toward Mylo's door.

"No," said the voice in his head.

Anthon hesitated, frowning and thinking rapidly. Too much was going on that he didn't understand. In particular, he was getting tired of being kept in the dark by whoever was behind that "voice."

"Why not?" he thought, and when no answer came he took another step forward.

"Don't," said the voice.

Anthon stopped again, but not indecisively. He was pretty sure now that, if the voice was actually coming from outside, its owner *could* read his thoughts. Its remarks were always too well timed for coincidence. In fact, thinking back, he remembered one point in last night's exchange on the train when the voice had seemed

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to slip and answer him directly. So he should be able to bargain. "You don't seem to want me to know who you are," he thought pointedly, "but you also don't want me to talk to Mylo. I'd like some information from you. Will you answer some questions—or shall I knock?" He lifted his hand toward the door.

He felt an odd throbbing in his brain, a sort of sub-verbal command to wait. Then that faded and the voice said, with obvious reluctance, "What do you want to know?"

"So," Anthon smiled slightly, lowering his hand, "you *can* read me. I thought so. Let's begin with the obvious. Who are you?"

No words formed, but Anthon "felt" the owner of the voice frantically seeking a way to avoid answering. "You've been needling me with the idea that the stars and their planets are real," he prompted, "as if you're certain of it. You've *experienced* interstellar travel?"

Pause. Then, quietly, "Yes."

"You're *from* one of those other worlds?"

"Yes."

A slight, remote hope rose. "Are you human?"

"That's a hard word to define," the voice said wryly. "In some senses, we would say yes. But we aren't of your kind."

Anthon had suspected that. He thought of the odd state he had found Mylo in before Landen and Karper had come. The idea of a connection was hard to escape. He asked bluntly, "What were you doing to Mylo Gotfry a few minutes ago?"

Another pause as the voice—Ozrlag, Anthon knew suddenly, without knowing how—tried to hedge and again found itself trapped. "We are interested in the origins of your present culture, but most of the information about them seems to have been suppressed. So we were especially interested in the contents of the documents you found. We were having your friend read them for us—using his ability to translate the archaic language. When you arrived, we were having him go through them very rapidly, because we anticipated trouble from the government and we wanted to get as much as possible before it came." Ozrlag seized the opportunity to change the subject, quickening the pace of his thoughts. "As you see, the trouble we anticipated has already come. And don't think it will stop here. We both wanted what was in those books, Anthon—you did and we did. Now neither of us may get it. But there may be more in the unopened compartments of that burial vault—the ones you tried to get Karper to help you open. You'd like to see it and we'd like to see it—and it's pretty obvious your government would also like to get their hands on it. Maybe we can stop them—but it will take speed and cooperation."

Anthon frowned. "Are you suggesting a deal?"

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"Yes. Go back to the vault—tonight. Lead us to it, and . . . and we'll send someone from our expedition to meet you and help you open it."

"Where is your expedition?" Anthon asked suspiciously.

"Never mind that," Ozrlag thought curtly. "You be there—and so will we."

Anthon drew a deep breath. "I think," he replied coolly, "that you want it more than I do. I'll agree—but only if you agree to provide more in return than you've offered so far."

"Such as?"

"Such as this." Anthon paused to compose his thoughts before beginning the proposition which had suddenly occurred to him. "There's no certainty that I'll be able to learn all I need to know about space travel from the books in the tomb. But you have experience. You can give us advice. You can help us get started."

"That's a big order," Ozrlag said after a while. "I doubt that you realize how big."

"No matter." Anthon was firm. "That's what I expect in return. If you want my help—take it or leave it."

A long pause—and, it seemed to Anthon—although he couldn't say why—a troubled pause. And then Ozrlag answered with similar firmness, "We'll tell you what we can—but only *after* you've led us to the vault."

Anthon thought it over. He seemed to have no more bargaining points. And the recent actions of Karper and Landen suggested strongly that getting to the vault first was a matter of some urgency.

He nodded slightly. "Agreed."

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Ozrlag shut off the transmitter and turned away from it with an emphatic, *Whew! Well, it's happened. Hope Mizhjar believes it.* The realization of the turn events had taken, and what he had got himself into in terms of promises, was a little awesome. *But,* as he reminded himself quite truthfully, *there's no point in worrying much over that . . .*

He got on the interphone to Amzhraz, the head of the research group that had been working through Gotfry. "Evidently you know your books were confiscated," he said without preamble. "Did you get anything you can use?"

Amzhraz made a modified affirmative gesture—disappointed, but not completely frustrated. "Yes, by pushing him. We'll try to keep track of the books, but we can't make just anybody read them for us. The lan-

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guage problem, you know. But we got enough to piece together quite an interesting picture. Look at this." He held a compact summary up to the phone.

Ozrlag glanced at it and his whiskers writhed in puzzlement. "Interesting," he agreed, "to put it mildly. I'm afraid I don't have time to study it right now, but I certainly will." He broke the connection, braced himself, and called Mizhjar.

"You did *what?*" Mizhjar rasped, drawing his lips tight against his teeth, when Ozrlag had finished summarizing.

"I admitted we were from offplanet," Ozrlag repeated quietly, forcing himself to remain calm, "and interested in their culture. And I . . . er . . . said we would send one of us to help him open the rest of that tomb."

Mizhjar struggled silently with his temper. Then he said tightly, "Ozrlag, you'd be a lot easier to take if you weren't so impulsive. What made you do a fool thing like that?"

"You said yourself," Ozrlag reminded, "that you could imagine circumstances where I would have no choice. They seemed to have arrived. Anthon—and the others—had me in a corner."

"I also said that anything like this was strictly a last resort, and I think you were too hasty—as usual—in deciding a last resort was called for. A moment's thought . . ." He broke off, radiating exasperation. "Exactly what pressure did Anthon put on you?"

Ozrlag cringed slightly. "He was suspicious and about to barge in on Mylo Gotfry when he had just been reading for us. I tried to stop him, but he threatened to go ahead unless I'd answer some questions. I was afraid if he talked to Gotfry right then he'd find out—"

"So you *told* him more than he would have learned from Gotfry! *Think* about what you did, Ozrlag! What did you accomplish? You just blundered in and . . ."

"He would have learned some of it anyway," Ozrlag interrupted hotly, "and then his curiosity would have driven him after the rest. I'm not convinced that I really made things worse than they would have been anyway. And meanwhile Karper had brought another ruler and they confiscated the books Gotfry had been reading. They'll be hunting for the others, too, since they know about the tomb. Anthon's probably our only chance to get at them first. He's actually serious about this thing, Mizhjar. And since he was going to know at least something about us anyway, sending somebody down cautiously at night didn't seem so—"

Mizhjar was twisting his tail in slow, ominous patterns. "You've got a glib tongue, Ozrlag," he said carefully. "But you still need some judgment to go with it. Your argument has a bit of merit— just a bit. And enough damage is already done that we might as well go through with it, just in case there really is something important still in that vault. But who

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should go? It'll be a touchy job. So far only Anthon knows about us—Gotfry has some inkling, but he doesn't understand—but whoever goes down to the surface risks discovery by others. He'll be after valuable information for our cultural studies-but at the risk of jeopardizing the continuation of those studies at any level. And at considerable personal risk." He looked straight at Ozrlag, his expression stony. "Since this was your bright idea, I think *you* should be the one to go."

"Me?" Ozrlag yelped.

"You," Mizhjar said with finality. "I think you may learn something from it. Since so much depends on your not making an ass of yourself, I suggest you get over to Amzhraz and start briefing yourself. And when you go down there—you'd better be careful."

"But . . ." Ozrlag started to protest and then broke off. The phone-screen had already gone blank.

Very briefly, he felt almost panic-stricken. Then, as he watched the afterimage fade away, he smiled to himself.

He had thought of another project.

To avoid the risk of unintended further damage to the tomb in which the books had been found, Anthon had transferred his crew's operations to another area before visiting Karper. He had even had the foresight to avoid making any fuss over that site, or giving the men any indication that it was the reason for suddenly moving their work elsewhere. Thus now, as he picked his way across the mutilated ground with no light but that of the moon, stars, and skyglow, he did not really expect to meet anybody. But his nerves and senses were tuned to a high pitch because of things that *could* happen—and in anticipation of meeting a traveler from the stars. He wasn't even sure, after the conversation he had heard between Landen and Karper, if they were looking for him. But he was sure he didn't want to be apprehended now. He had bigger things to do.

The air was getting slightly chilly and Anthon was very conscious of the smell of recently turned damp earth. And then he "heard" Ozrlag: "Anthon . . . you're nearly there? Don't answer out loud."

"Yes," Anthon said silently.

"You're alone?"

"I think so." Ozrlag must have known that—unless his mind-reading abilities were limited and he needed to check them against perceptions of Anthon's which he could not see directly.

"Good. Stop where you are. I'll join you in a minute." Anthon stopped, anxiously scanning the darkness around him for his first glimpse of an extraterrestrial. He tried to imagine what Ozrlag would look like, and, of course, how he would be traveling . . .

He wasn't sure exactly when he first caught sight of him. He just knew, after a while, that an indistinct

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shape had detached itself from the darkness and was moving toward him across the ground, perhaps a dozen yards away, eyes glowing faint yellow. As Ozrlag came closer, Anthon saw that he was walking upright on two legs and waving a long tail behind him, looking uncannily like a large cat modified for an erect posture and standing about four feet tall. But his slit pupils were horizontal, his tail was forked, he had a fine fuzzy covering instead of long fur, and fingers instead of paws—and he was wearing simple clothes and carrying a hexagonal suitcase-like thing in one hand. Anthon felt an unaccustomed excitement as the alien strode up, stopped three feet in front of him, and looked up at his face. But he saw no evidence that Ozrlag felt any similar emotion at meeting him.

"And so we meet," said Ozrlag—but he said it silently, the same way he had said everything so far. Anthon felt vaguely disappointed not to hear his actual voice, but he could easily see good reasons. Ozrlag continued briskly, "Nobody else is to know of my visit. Nobody. You understand that?"

Anthon nodded. "I understand."

"How great is the danger of our being discovered? Take me to the tomb while you answer."

Anthon started walking. "I don't know. I've been away, and I'm not sure what Karper and Landen—and my boss—are after. My guess is that they want to confiscate and suppress whatever's in the tomb—although I don't know why. But, if they're really interested, they'll be able to find the vault easily enough. I never told my boss exactly where it is, but he knows roughly where I was working right before I went to Karper. So if they asked him, he could help them narrow their search quite a bit."

Ozrlag was keeping pace with Anthon's long strides with no apparent effort. "I was afraid of that," he thought. "We'll just have to hope we get there and get what we want before they do." Anthon tried to interpret the emotional tone he seemed to sense with the words. He had an impression that Ozrlag was quite nervous about something, but he couldn't tell what—or even if that were actually the right interpretation.

They reached the vault. It sat, partly uncovered and surrounded by a thin moat of muddy water, at the bottom of a depression made by earthmovers. The region was full of such depressions, many of them containing ruins or monuments, but few of the other structures were quite as large or quite as substantial as this one. Still, the difference was not so obvious as to automatically attract the attention of any casual passerby.

Anthon and Ozrlag warily circled the rim of the depression, looking for signs of present, or recent activity around the tomb. Seeing none, Anthon nodded and started down the slope. Ozrlag scurried on ahead and began opening his suitcase.

And a light appeared from no-

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where, swept over the depression, and locked on Anthon. "Hold it right there!" a voice barked. "Security check!"

Anthon stopped where he was, with a sinking feeling. Ozrlag was already down, but his chances of escaping discovery were slight. And the blinding light remained fixed on Anthon's face as the person wielding it trotted closer. For an instant he toyed with the idea of trying to run, but then the watchman came close enough so Anthon could see that the lantern was attached to the barrel of a decidedly ugly handgun. Anthon stood very still.

As the watchman drew up in front of him, he stuck a walkie-talkie back into its holster and lowered the lantern just enough to make it a shade less unpleasant. "It's you, all right!" the watchman declared triumphantly, grinning and showing several gaps in his teeth. "They thought you'd come back here. You just stand right there, son. They'll be along in a jiffy."

Anthon stood—being held at gunpoint provided undeniable incentive. The watchman kept glancing around nervously, as if looking for something, but he never took the light—and gun—off Anthon.

"They" came within two minutes. A supervisor's cart whirred across the ground, bounced to a halt ten feet away, and Karper and Landen jumped out opposite sides of it. "That's the one," Karper said with obvious satisfaction. "And I'd guess this must be the place. Thought he might lead us to it."

"There was someone else with him, sir," the watchman said. "But I didn't get a good look and I don't know where he went. Do I still need to keep this one covered?"

"No," Landen answered. "He's under control. Look for the other one."

The watchman took the lantern off Anthon and swept the area with it, first around the rim and then down in the depression. Finding nothing, he started around the rim, keeping the light aimed down at the tomb. Suddenly he stopped. "Something moved down there," he whispered. He took a sudden quick step, there was a flurry of movement in the depression, and then Ozrlag was caught in the beam, his back against the tomb and staring up as if the light had him pinned there. It was the first light bright enough to show colors since he had met Anthon.

Landen swore softly. "What on Earth is *that?*"

Karper blinked and shook his head. "A giant pink pussycat?" he giggled nervously.

"Shall I shoot it?" the watchman asked. He sounded eager.

"No," Landen answered at once. "But stay ready." He turned to Anthon. "What do you know about that thing down there, Hillar?"

"That's Ozrlag," Anthon said, distorting the jömür sounds slightly to fit his mouth. He looked squarely at

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Karper. "He's from one of those other planets you called hogwash. He came down to help me open the rest of the vault and get out whatever other books are there. Because"—and here he sped up as if to hurry past things which were dangerous but had to be said—"I didn't want you to get hold of those like you got the first batch. I don't understand why you want to suppress the idea of space travel, but it isn't going to work. Because even if you get these books too, Ozrlag's people are here and they know all about space travel and they're going to tell us!"

Karper's shock at the tirade was obvious and not surprising, but it was Landen who answered. "Why do you assume we want to suppress it, Anthon?" he asked quietly.

Now Anthon was taken by surprise. "Don't you?" he asked.

"It was a possibility," Landen admitted, "but only as a last resort. Look . . . we know the state the world's in, too. It's discouraging. People—a lot of people—would jump at the chance to go somewhere else. *If* the chance existed, there'd be fierce competition for the available spots. We might have to play it down to avoid new domestic troubles. We'd *certainly* have troubles if word spread that there was a way out when there really wasn't. So if this space travel idea turned out to be just a myth—yes, we'd suppress it. But if it actually held water, we'd want to learn to use it. So before anything else, we wanted to find out." He glanced down at Ozrlag. "Your friend here throws a whole new light on things. How can I talk to him?"

"Just talk," Anthon said. "Or even just think without talking. I don't know how it works, but he'll understand you."

Landen looked down at Ozrlag and tried to affect a friendly smile. "So," he said, "you folks can tell us about interstellar travel, eh? Well, we'll be *delighted* to hear what you have to say!"

Ozrlag seemed, somehow, to shrink from them, and his "voice" spoke to all of them. "No," it said very quietly, "you won't. I hate to disappoint all of you, but what you want to do . . . you can't."

Something in Anthon tensed. "Are you trying to say," he asked, completely confused, "that interstellar travel is impossible after all?"

"I'm saying," Ozrlag returned slowly, "that for *you* it is impossible."

Landen and Karper glanced at each other. Anthon fought to keep his mind steady and absorb what Ozrlag was saying. "What do you mean?" he asked tightly.

"Your ancestors played you a dirty trick," said Ozrlag. "Anthon . . . you, at least, knew we were reading the first batch of documents you found here by using Mylo Gotfry as an intermediary. You knew he was going fast. Our researchers have absorbed far more from those documents than you have—enough so that

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we now have a pretty good idea of how your world got the way it is."

"Come to the point!" Landen snapped.

"As soon as I can," Ozrlag replied, refusing to hurry. "You won't understand it without the background. Not long before this tomb was built—during the lifetime of the man buried here—some of your ancestors took the first small steps into space—the first small steps away from confinement to the home world. They reached your moon; they sent a few instruments to other planets of this system. And then they stopped.

"Why did they stop? Because of public pressure to use the resources that were being used in space on domestic problems instead . . . things like pollution and overpopulation and poverty. Poverty turned out to be the one that got the most demand, and the governments gave it. They tried to end it with handouts. It didn't really work, of course, any more than it's ever worked for anybody else. But it gave a comforting illusion for a while—especially since population was at such a level that to implement the poverty program they were incidentally forced to solve some of the pollution and energy problems. They had to continue developing their technology far enough to get breeder reactors into routine use for power generation—but after that they let innovation die out. And the breederization and ecology readjustment programs increased their capacity for feeding people so drastically that they could quit worrying about overpopulation. They wouldn't strain their new capacities for a long time—and given the choice of a real effort to curb population growth, or a way of absorbing more children, they overwhelmingly opted to absorb more people.

"But, of course, eventually the population did catch up again—and things deteriorated to what you have now. A culture with nuclear power driving television sets and air-conditioners—anyway until the fuel runs out, as it surely will—and so many people they all have a full-time struggle to get enough to eat. And no way out."

Anthon felt himself starting to shake with emotion. His dream was crumbling. "No way out?" he echoed. "The stars—"

"You can't get there from here," Ozrlag said harshly. "You *could* have—if they'd continued their efforts from the start. But they chose to stop space travel and let population growth continue unchecked; they should have done just the opposite, on both counts. I said going to the Moon was a small first step. I meant it. It was a tremendously impressive undertaking at the time, but you can hardly conceive how much more difficult it is to reach the stars. It can be done—but only with many, many man-years of dedicated work once you've passed the Moon-rocket stage. But *you* won't even be able to get that far, now—because it would require a kind of education and re-

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search that your static culture hasn't had for centuries, and it would require great amounts of manpower and material. And a subsistence economy can't spare manpower and material for anything except keeping itself alive."

"But," Karper protested, "if you already know the techniques and can teach us—"

"It still won't work," Ozrlag interrupted bluntly. "Even if we provided all the teachers gratis—which is a bit much to expect—you simply can't spare the students. Try to realize, we're talking about *massive* education and construction projects, even for as small a problem as going to the Moon. *Even if we try to help you,* you're trapped. I'm sorry." He looked pensively at the tomb. "I think the man who was buried here was upset at the space programs being killed at that crucial time. I think he saw, at least dimly, why it was wrong, and preserved his books in the hope they would help somebody get started again later. He didn't realize that his message would arrive too late to help."

Anthon stared numbly into space at the wreckage of his idea. He distantly heard Landen saying, "But there are more direct kinds of aid. You people have starships already, and there must be something we could provide in exchange." He paused, then blurted out, "And if coercion is necessary, we have you as a hostage."

It sounded futile to Anthon, but then he noticed that Ozrlag unmistakably grinned at Landen's suggestion. "Well," the jömür said, "I doubt that I'm a very *valuable* hostage, at the moment, but I'll see what can be arranged."

And at those words Anthon felt a thin thread of hope still alive within him.

EPILOGUE

Anthon paused in the door of the jömür ship to survey his new home before becoming the first man to set foot on it. Never before had he seen such a wealth of growing plants as those which carpeted the hills rolling off to the horizon, or a sky like the one he saw now, utterly clear and deep blue except for a bank of billowy white clouds in the west. Never had he heard such a chorus of smaller living things, or felt such refreshing breezes.

Full of exhilaration at his role as chosen leader of the new colony, he shouldered his ax and gun and strode down the gangway onto the soft grass. He waited and watched proudly as the other men, women, and children followed him onto their new world. In five minutes they were all there, waiting, as Ozrlag came down alone to say good-bye.

"Terrific!" Anthon laughed as Ozrlag approached. "A new beginning—thanks to you. How many people will you be transplanting altogether, and how long will it take?"

"Hm-m-m?" Ozrlag's surprise at the question was unmistakable.

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"Why, this is all, as far as I know."

"All?" Anthon's jaw dropped. He hadn't been in on arranging the details himself, of course, but he'd been led to believe . . . "I thought —" he began.

"I thought we'd been over all this," Ozrlag interrupted, hardly listening. "Earth couldn't possibly offer us anything to finance a lot of these superferry trips, now, could it? And even if we wanted, obviously we couldn't move enough to make a dent in the population. But when we found out you and some others were interested in trying to make a better go of it elsewhere . . . well, it was easy to arrange for one small group, and it fit right in with a project I'd thought of for my apprenticeship—"

"Apprenticeship?" Anthon echoed.

"Yes. I thought you knew. I'm an apprentice sociologist and I thought a good topic for an experimental study would be the efforts of intelligent beings transplanted from a place like Earth to get along on a fresh world—"

"Ozrlag!"

The call broke in sharply, its tone peremptory. Mizhjar had appeared at the top of the gangway and was insistently beckoning for Ozrlag to return.

Ozrlag turned back to him with what Anthon did recognize as a good-natured but impersonal smile. "Good-bye," he said to the whole group, "and good luck!"

Anthon stared silently after him, stunned, as he hurried up the gangway and he and Mizhjar disappeared into the ship. Then, as the gangway began to slither back into the ship, he turned back to his colony.

And saw it transfigured. The hills were vast expanses of loneliness now, the chorus from the woods warned of animal pests yet unknown, the chill breeze bore the stink of alien poisons, and the clouds that had billowed pleasantly now loomed menacingly. The idyllic landscape had suddenly become a hostile power against which Anthon was pitted with little help, unskilled and meagerly provisioned.

Guinea pigs, he thought bitterly. He heard the ship starting to lift off behind him, but he didn't look back. *Guinea pigs transplanted from one place where we could barely live to another that dares us to do even that.*

The ship was gone now, and Anthon finally fully realized that, for *his* people, the stars would remain unreachable long past his lifetime.

But maybe not forever, he thought fiercely, choking down his disappointment. *Our ancestors were at this point once. Maybe we* can *avoid some of their mistakes. And then someday . . .*

He picked up his ax and gun and gestured to the others to follow him. They had work to do. One last time, he quietly cursed his ancestors' shortsightedness. Then he let his eyes wander to the sky and to a distant future he would never see, and somehow he managed to smile.

Someday . . . ■

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Real Science for Real Problems

JOHN R. PIERCE

It isn't obvious that Bell Laboratories runs a major educational "University"—but it does, because it has to. Educational psychology is, consequently, highly important to the Labs. And because it is a business—utility commissions and stockholders alike want expenses down!—Bell Labs has been applying the "Schwartzberg test" to educational psychology for years. Any theories have to work*!*

In the process of learning how to learn, the "University of Bell Labs" has developed solid proof that students should not *be allowed to determine how they are to be taught, and what is "relevant"!* THE EDITOR

Science long ago showed itself powerful in the world, yet, the behavioral sciences have had far less direct impact on practical affairs than have physics, or chemistry, or biology. Why is this? We are taught that knowledge is power. Is there some knowledge which has no power in man's world?

It is generally admitted that the behavioral sciences are less advanced than the physical sciences. Further, behavioral research is not often cultivated in the sort of attachment to real problems that has characterized the pursuit of the physical sciences in large industrial laboratories. It is the writer's contention that under suitable conditions, behavioral research can produce real science useful in the solution of real problems. To illustrate this, he proposes to describe some research relevant to learning which has been carried out at the Bell Telephone Laboratories.

Except for the U.S. Government itself, the Bell System is the largest educational institution in the nation.

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Its instructional activities range from telling a new employee how to fill out his time card, through initial training of telephone operators, to giving graduate-level courses on high temperature hydrodynamic phenomena. With such a tremendous number of man-hours going into teaching and learning, the Bell System could profit from any basic knowledge that helped to improve the learning process. Even a slight improvement could be of great value. But the improvements due to some contributions by psychologists have been more than slight. In one case, a critical training program was cut from nine weeks to nine *days*, and with superior results.

Experimental psychology is not new at the Bell Laboratories. In the 1920s and 1930s, Bell Laboratories scientists, such as Harvey Fletcher and Herbert Ives, carried out pioneering investigations of human speech, hearing, and color vision,[1] in connection with telephony and television. Visual studies are now carried out in connection with PICTUREPHONE® research. In the 1940s a Human Factors Research Department was set up to study customers' preferences and the human abilities and limitations that are significant in the design of communication equipment.

Psychological research has continued to expand, and valuable work on human factors and psychological questions is now carried out at several locations. The material that follows draws mainly on the work done in the Behavioral Research Center at Murray Hill.

The Behavioral Research Center traces its origins back to 1955[2]. Today it includes twenty-one doctorate-level members of technical staff

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Fig 1. These dots are computer generated, and they are NOT random!

and eleven assistants who are investigating a variety of psychological topics, such as auditory and visual perception, memory and learning, judgment and preference, and language.

The primary mission of the Behavioral Research Center is to pursue basic research, directed toward a fundamental understanding of psychological processes. But in psychology, as in other fields, there is a continuous graduation between basic and applied research. A single psychologist's attack on a problem may shift back and forth along the continuum, and psychological research at various points along the continuum is found at each of the Bell Laboratories locations mentioned above.

Basic discoveries in psychology, again as in other fields, may have implications for areas far removed from the problem originally investigated. As examples, consider two projects that set out to study visual perception, but proved to have unforeseen relevance to learning and training as well. In one case, a primitive sort of visual problem-solving and learning was found; in the other, a surprising inability to learn was demonstrated.

Learning to See

The patterns of random dots shown in Fig. 1 were generated by a computer, in order to investigate vis-

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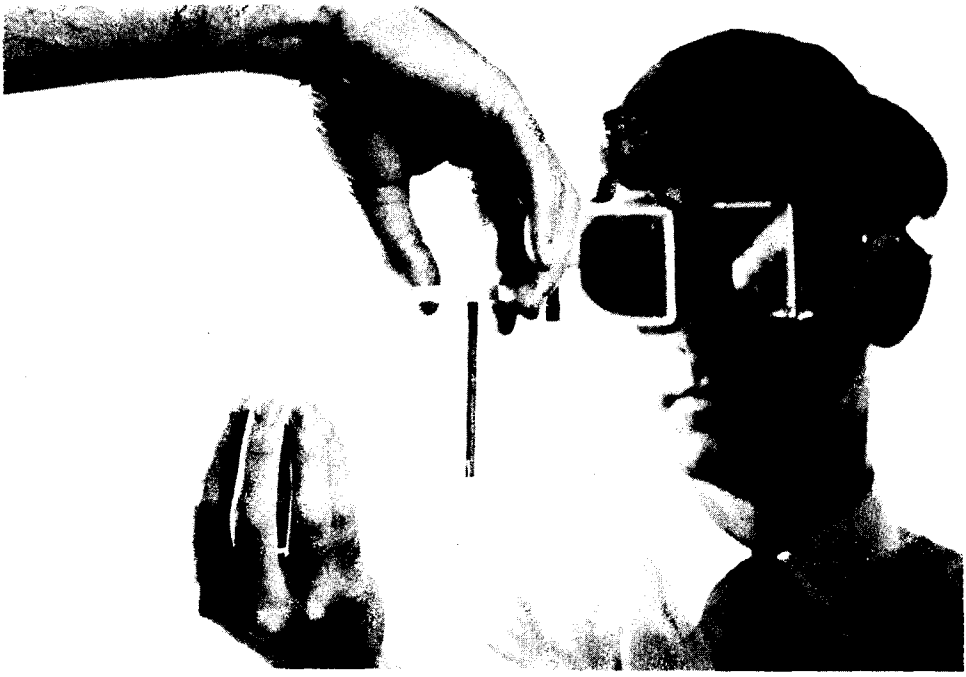
ual depth perception, or stereoscopic vision[3]. Although the dots are arranged randomly in each of the two figures, the two figures are not at all randomly related to each other. The outer parts are the same in the two figures, but there is a square region in the center of one figure which is shifted a short distance to the right of where the matching region falls in the other. The result is that when you combine these two figures into one by looking at them in a stereoscope, you see a square standing out very vividly in depth, some distance in front of the background. This demonstrates that in order to see a form in depth, you do not have to see the form with each eye—there is no central square visible to either eye alone. Instead, the perception of an object in depth can be produced by brain processes that go on only *after* the images from the two eyes have been combined.

It turns out that random-dot patterns tell us about fundamental processes not only in vision, but in learning as well. Some random-dot stereograms pop out in depth as soon

Fig 2. The hand is quicker than the eye! Reversing spectacles have proven hands can learn new ways far faster than can eyes.



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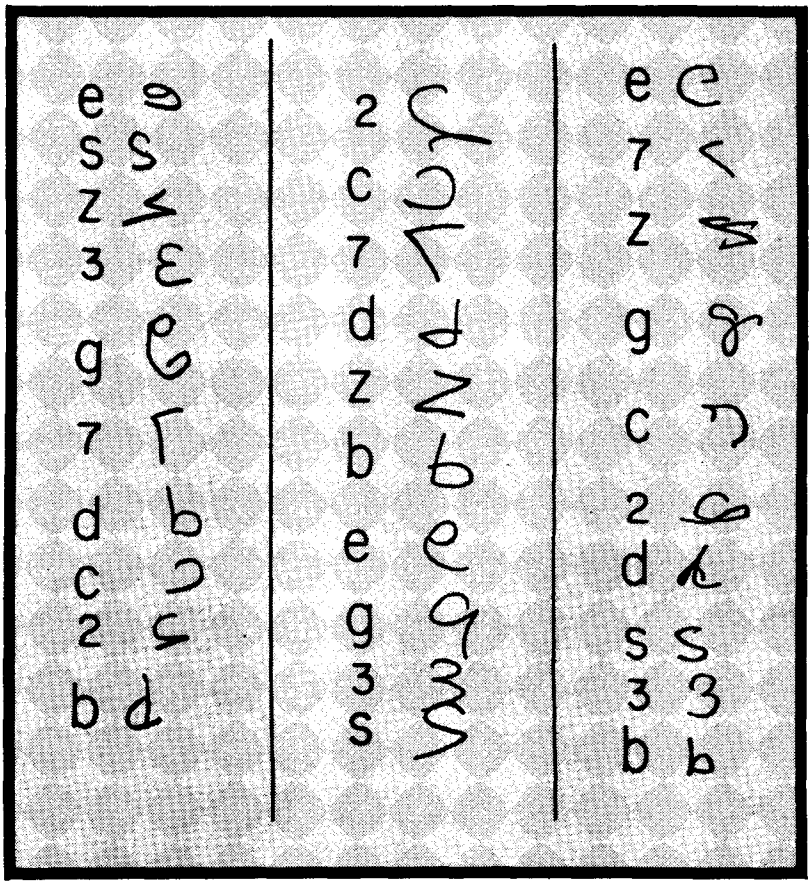

Fig 3. But the "trained" hands do get confused. . . .

as you look at them in a stereoscope. With others, you at first see only a flat surface; over a period of seconds or even minutes, a figure in depth gradually emerges. Once you have seen it, you can see it almost immediately on further viewings. What we have here may be a very elementary form of problem-solving and learning: on a completely unconscious level, the brain strives to fit the two eyes' images into a single coherent structure, and once it has solved that puzzle, it can do so effortlessly on future occasions. Perhaps further investigation of this phenomenon will suggest ways to make other kinds of problem-solving and learning easier.

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The research with stereograms shows that a primitive sort of learning can go on in the visual system. Another line of investigation, though, has uncovered some serious limitations on learning in visual perception. It has been known for years that people can learn to get along well while wearing prismatic spectacles that displace or even invert what they see (Fig. 2). The common belief was that the visual system adjusts itself, counteracting the optical transformation. A more recent set of experiments indicates that vision is not that adaptable[1]. Rather, the kinesthetic sense—our feeling of where our hands are and which way they are moving—readjusts itself so that our movements are appropriate to the distorted visual world. For example, when people wore spectacles that optically reversed the visual input into its mirror image, they soon overcame their difficulties in writing and drawing. But then when they closed their eyes, and tried to write letters and numbers that the experimenter called out, they often wrote *backwards* when they felt that they were writing normally[2]. Fig. 3 shows what three people wrote after wearing reversed spectacles.

Thus we now know that vision is far less educable than had been supposed, whereas the kinesthetic sense is surprisingly flexible. Such findings suggest questions about the design of visual displays and control systems that optimize human performance. Does the kinesthetic adaptability of the hand mean that we do not have to worry about certain distortions in visual display systems, even major distortions? Would characteristics of the kinesthetic system make some visual distortions particularly disturbing, while other distortions might actually improve performance? Will a person who works with one sort of display—such as a magnified image—encounter predictable kinesthetic problems when he switches to a different display?

How we perceive, how we fit our actions to our perceptions, how we learn to see things in new ways, and what inherent limits there are on our perceptual flexibility—all of these facts are ultimately important to teaching and learning. What about research that is concerned more obviously with the sort of teaching that we usually think of?

The remainder of this paper deals with research on three such topics: programmed instruction, self-selection of study procedures, and short-term memory.

Programmed Instruction

A major source of interest in the learning process is the Bell System's increasing reliance on programmed instruction. The term "programmed instruction" covers a variety of training techniques that differ from the traditional combination of classroom lectures plus textbook reading. For one thing, the teacher is not the major source of information—in fact, there often is no teacher present

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while the student is learning. The student can proceed through the material at his own pace. The material to be learned may be presented in various forms, ranging from a printed booklet or a tape recording, to a printed roll of paper in a simple mechanical "teaching machine," to a computer-produced display on a cathode-ray tube. Instead of passively reading, the student must answer frequent questions or fill in blanks, and he finds out immediately whether his answer is right or wrong.

In recent years, nearly a third of a million Bell System employees have taken programmed instruction dealing with various areas of telephone company operations. There are now 24 programmed courses in use, with 14 more currently in development.

It is easy to see why programmed instruction is burgeoning when you compare one of the Bell System's new programmed courses with the conventional course that it replaced. The course, developed jointly by AT&T and the American Institutes for Research, provides basic training for the men who maintain and repair the equipment that carries long-distance calls. The old course took nine weeks. In the new programmed course, students progress at their own speed and finish in an average of nine *days*. The chief gain, though, is in teaching effectively what the trainees need to know. Much more than in the case of a lecture course, devising a programmed course compels a clear formulation of objectives—what we actually want the trainee to know. The result is that, in striking contrast to the old course, trainees who finish the new programmed course can actually perform the tasks they were trained for the first day on the job.

Another comparison between programmed and conventional instruction involved a Bell System course called Basic Electricity[6]. Although the saving in learning time for the programmed version was not great, the improvement in amount learned was. Many people who took the old conventional course scored so low on tests that it is doubtful that they got anything useful out of the course. With the programmed course, almost all of the test scores were satisfactory or excellent (Fig. 4).

The introduction of programmed instruction is usually credited to a Harvard psychologist, B. F. Skinner[7]. He based his training procedures on fundamental discoveries about the nature of the learning process—and, in fact, the learning process in rats and pigeons. Not everything that helps pigeons learn also helps people, but there are some striking similarities.

One need not rely on experiments with animals, nor on psychological theories, to devise and evaluate programmed courses. More important, one need not depend on subjective impressions about what is a good way to teach a subject. As students proceed through a programmed course, they are continually answer-

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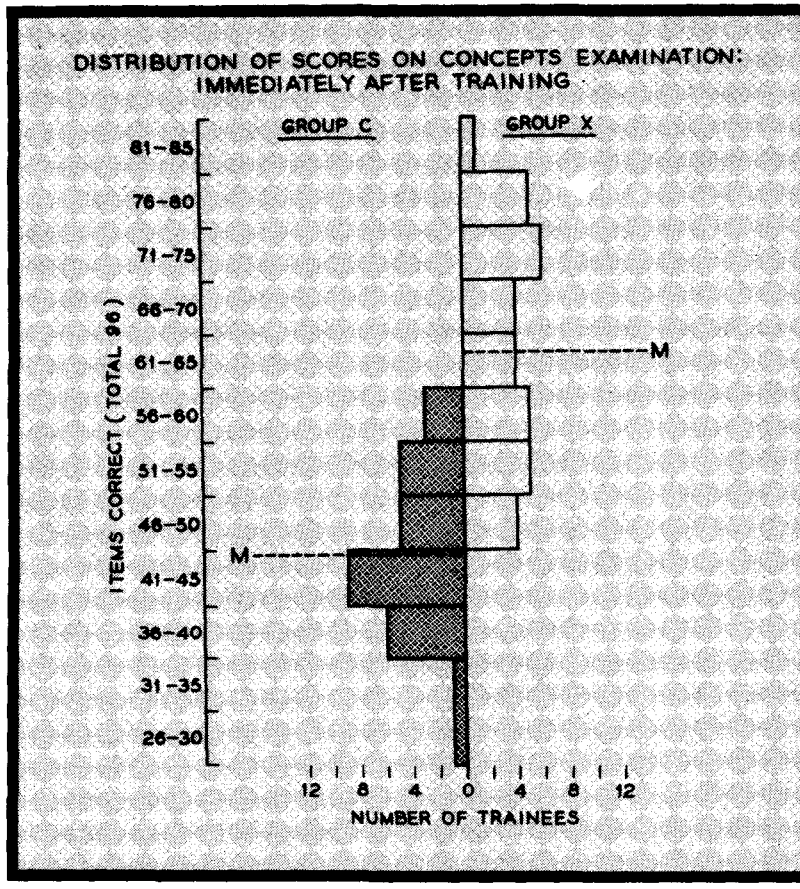

Fig 4.

ing questions about it. Their answers provide massive and detailed feedback about what the students are learning and what points are giving them trouble. Any failure to learn is a sign that the program should be improved; careful analysis of students' errors can pinpoint what needs revision.

Thus, programmed instruction offers a continuous check on whether the educational goals are actually being reached, and it allows a uniformity of instruction that is particularly important to an organization that must give identical training to employees in many different geographical locations. In contrast, think of

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how different a course can be when taught by different teachers. And think of how hard it is to get an objective evaluation of how well a particular teacher, or a given textbook, is teaching a course.

"Experts'" Opinions

The fact that it is feasible to evaluate programmed instruction does not always insure that a programmed course *has* been appropriately assessed. In 1965, for example, a programmed course designed to teach listening skills was brought to our attention. The company that markets the program was able to show us impressive test results and glowing testimonials from experts in programmed instruction. Two Bell Labs psychologists had their doubts. Using a variety of test questions, they compared people who went through the program with people who were given no training. The people who took the course did do somewhat better than the no-training group when they answered the test questions that the vendors of the course supplied—though not nearly as much better as we had been led to expect. However, when other equally plausible test questions were used, the scores were just as good whether the person had taken the course or not[8].

Similar results emerged from a follow-up study done by psychologists in the Training Research Group at the American Telephone and Telegraph Company[9]. This time a special "job-relevant" test was used. It measured the particular listening skills that we want our customer service representatives to have. Experienced service representatives scored much higher on the test than did college students with no such experience. But neither group showed any improvement after taking the programmed course on listening skills.

These findings have saved the Bell System considerable time and money. But when the vendors of the course were told about the first study, they sent us a long, strongly-worded letter, urging us not to publish our findings. They said that casting doubt on the course's effectiveness would be unfair to the people to whom it had been sold, the people who had taken it and the "experts" who had praised it. Nothing was said about fairness to those who might buy, take, or recommend it in the future. The course has had a wide and continuing sale.

This incident points up the dangers involved in uncritically accepting supposedly "expert" opinions. Far more than in a physical science, a person may mistakenly believe he has special competence in a behavioral science, and may get others to accept his judgments as authoritative. I am sure that most of us have, on occasion, felt perfectly competent to decide what is, or is not, a good training method. Some of the examples I shall get to later show that such intuitive decisions may be badly mistaken.

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Predicting Instructional Effectiveness

Even people with excellent credentials can be disastrously wrong when they try to judge instructional materials without carefully testing them. For example, twelve high school principals were asked to predict the effectiveness of several samples of programmed instruction. Then their ratings were compared with the actual measured success of the programs[10]. The judgments of these trained educators proved to be wrong more often than right: the average correlation between their ratings and actual effectiveness of the programs was minus .72. Graduate students in education were equally misguided in their judgments, in a follow-up study conducted at U.C.L.A.[11].

There may be a simple explanation for why these educators were so consistently wrong. They had just taken courses about programmed instruction, in which they were told that repetition is very important for learning. Of course it is; everyone knows that repetition is important. So, in rating the materials, they looked for repetition and tended to rate the material favorably if they found it. What they had not been told—most likely the instructors in their courses did not know it either—is that repetition is helpful only if there is some *delay* between repetitions.

Two Bell Laboratories psychologists, working on quite different sorts of research, found evidence for the importance of delaying repetitions. One study, using specially written textbook passages, showed that immediate repetition of a fact was of no help whatever[12]. The other study, in which students learned lists of pairs of words, demonstrated the same thing. As Fig. 5 shows, three minutes after learning a list, students could correctly recall 50% of the items that they had seen just once. Seeing an item twice boosted their correct recalls to 67% provided there was at least 10 seconds' delay between the two occurrences of the item. With only 2.5 seconds delay between occurrences, the repetition produced little more learning than a single presentation[13].

Our intuitions about repetition may lead us astray in other situations, too. Suppose you have a certain number of facts to get across and a certain number of pages to do it in, allowing several repetitions of each fact. How should you arrange the material? A first guess might be to have an equal number of repetitions of each item of information, as, by presenting all the items and then going back over them all one or more times. Experiments have revealed, though, that the best bet is to introduce new items gradually. This means that the last new items get no repetitions, whereas the earlier items are repeated several times. Gradual introduction of new material ("snowballing") leads to the best learning of the whole set of facts[14].

A research project that deals

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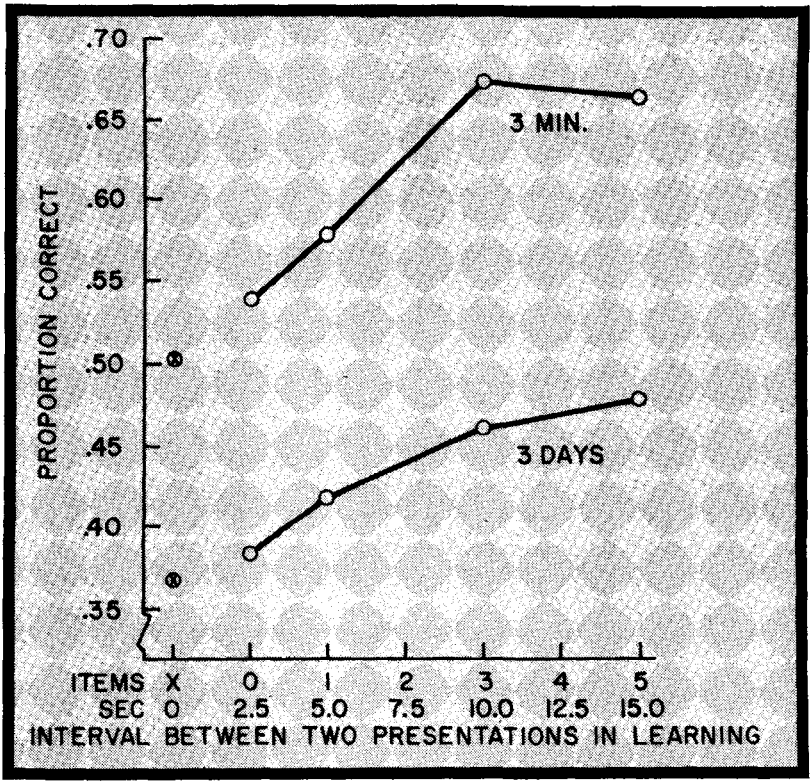

Fig 5.

mainly with conventional printed texts has also shed light on an important feature of programmed instruction: the questions that a student is continually obliged to answer while working through a programmed course. Questions are helpful in several different ways[17]. First, questions let the student know when he has missed a point. Second, they invoke extra mental repetitions of important information. Third, questions insure that the student will continue to pay attention to the text.

These helpful effects of questions can easily be added to conventional textbooks. Students who simply studied a textbook in preparation for an exam did not do nearly as well on the exam as students who jotted down answers to two factual questions that were inserted after every three pages of text[18]. The bar on the left in Fig. 6 shows the average exam score after studying the ordinary textbook. The middle bar shows that

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students who read the text with interspersed questions did more than twice as well on exam questions that covered the same information as the text questions covered. What is more interesting is that adding questions to the text produced a 40% improvement in learning material that was *not* covered by the questions—the right-hand bar.

How can we tell in advance whether a new course of programmed instruction is likely to be effective? As I have already pointed out, we cannot merely ask someone to look over the material and give a judgment. Such a subjective evaluation may be very unreliable, even if the person is presumably an "expert." The best way to assess the course would be to have a large sample of students go through it, but that could be both expensive and time-consuming. Two promising methods for quickly and inexpensively screening instructional material are being studied at Bell Telephone Laboratories[17].

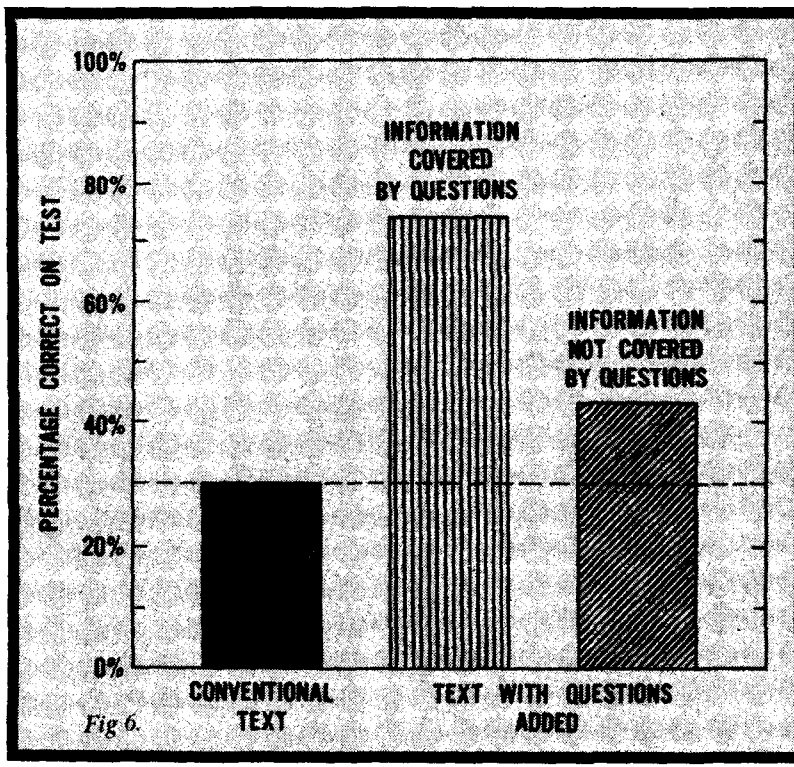

Fig 6.

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In the first method, several people take an "open book" exam on the material. They answer questions while the written material is right in front of them, instead of having to learn it. *How long* it takes to answer the questions is a predictor of how effective the instructional material will be. This technique also helps to reveal difficulties that the author may have overlooked.

With the second technique, no one has to even look at the material. Instead, a computer calculates the average sentence length, average word length, and average number of syllables per word—the last is done by counting the number of vowels. Sentence length is a rough measure of sentence complexity, while word length and syllables-per-word correlate well with word rarity. Both sentence complexity and word rarity are known to make sentences hard to understand and remember. So if a course scores poorly, the writing may be too pompous and complicated. Careful editing should improve it.

Another guide to writing effective training materials comes out of studies of the nature of language and understanding. When people had to read a sentence and then answer a question about it, it took them 15% longer to answer if the sentence was in the passive voice rather than the active [19]. Stylists have long condemned the passive voice, endemic in science and engineering publications. Now research backs them up. Scientists and engineers, please note.

Tips to Students

I have mentioned that many of us think we know how to teach effectively. We may be even more confident that we know how best to study and learn. Again, work by psychologists indicates that students often choose inefficient learning strategies. A simple suggestion about how to learn efficiently sometimes leads to marked improvement.

Consider the task of teaching an electrician the color code for resistors. People who merely memorize the code—yellow is 4, green is 5, and so on—remember less, several months later, than people who are given simple mnemonic phrases, such as "A green five-spot" or "A yellow dog has four legs" [20]. At Stanford University, psychologists demonstrated a similar effect of mnemonics on memory for lists of words [21]: when students were told to make up a story that included all the words on a list, instead of just studying the list over and over, their retention increased dramatically—from 13% correct to 93% correct!

Even when the student knows about alternative study methods, he may choose unwisely among them, according to a study done at Bolt Beranek & Newman. People were being trained to distinguish and identify various acoustic signals. In the first part of the experiment, the students were given no choice of training procedure. Certain procedures proved to be much more effective than others—for example, seeing

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a description of the sound while hearing it was better than hearing the sound and trying to identify it before seeing the proper description. In the second part of the experiment, the students were allowed to decide which of the procedures they wanted to follow. They chose the less effective ones most of the time, and their learning suffered accordingly: there was a correlation of +.97 between a measure of how often they chose the less effective procedures and how little they benefited from the training[22].

The implication of these studies is that students often do not know what is good for them, and do not know that they do not know. If the teachers are insensitive to what the students are learning, a course may actually become an impediment to further learning. For example, students were asked to read eighty pages from a physics text and then to write essays on several concepts from Newtonian mechanics, such as momentum. As expected, the essays were, superficially, much more like a physics text than were essays on the same topics written by students who had read a biology book instead. But in many cases the essays were complete nonsense [23]. The students *had* picked up the jargon of physics. They had learned to write something that superficially resembled physics but did not actually say anything.

Does this sort of thing happen in real life situations? It certainly can. Let me quote from a talk by Columbia's Professor William W. Havens, Jr. at the American Institute of Physics on October 1, 1967. He was commenting on college men who had taken an advanced science program as top-ranking high school students. "Those that I talked to about physics in their sophomore year at Columbia," Professor Havens said, "had picked up a great deal of the patter of physics with very little substance . . . We were faced with the problem of cutting the very good students down to size . . . They really didn't know very much but thought they knew a great deal."

It is clear from what Professor Havens said that an ill-conceived course can do worse than nothing; it can make people unteachable—at least temporarily—by making them believe they understand something when they really do not.

Short-Term Memory

So far we have been considering how to get information into long-term memory— how best to learn things and have them stick for weeks, months or years. Short-term memory is just as important. Short-term memory is the temporary mental storage we use when we take notes during a lecture, copy information from one page onto another, or look up a telephone number and then dial it. One might think that short-term memory is just a weaker and more fleeting form of long-term memory, but psychologists have found that the two have some quite different characteristics.

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One of the most striking features of short-term memory is that even if the information to be remembered is presented in visual form, the memory of it is most often in an "acoustic" form[24]. A person who looks at a string of numbers or letters tends to remember them as if he had heard them instead of seen them. If he writes them down immediately, or checks them off on a check list, his errors are likely to be substitution of letters that *sound* alike, rather than letters that look alike.

Even when the material seems well-suited to being remembered in visual form, people tend to put it into "acoustic" form for short-term memory. Of seventy-seven people who were shown pictures of several colored geometric shapes, only two tried to remember them as visual patterns [25]. The other seventy-five remembered them by "saying to themselves" a description in words, such as "three green circles and two yellow squares." This experiment also demonstrated again that people can profit from simple hints about how to carry out a task. Some people were asked to concentrate on remembering the colors and not to pay so much attention to the number of objects and their shapes. People who remembered the pictures as "three green circles" and so on usually could *not* increase their accuracy on colors. If they were told to remember the information in a different order, such as "green, blue; circles, squares", they could raise their accuracy at will on any one feature.

The peculiarities of short-term memory offer hints about how to cut down on errors when numbering or coding items for future use. We should consider the principles that govern short-term memory whenever errors are costly or dangerous—when assigning emergency telephone numbers, or code numbers for tapes in a computer library, engineering drawings, circuit cards in an electronic switching terminal, reference manuals, or items in a stockroom.

The acoustic character of short-term memory, for example, means that the choice of letters for a coding system can make it much easier, or harder, to recall items, even over a period of a few seconds. Recall is much better if the code employs letters that sound different, such as C I K and M, and much worse if the code uses acoustically similar letters like B D P and T [26]. It is unfortunate, then, that not only do the letter O and the number 0 look alike, but they also are both called "oh." Homonyms embody the ultimate in acoustical similarity, so that it is no wonder that so many dialing errors result from interchanging O and 0.

A British psychologist has drawn on the results of experiments like these in designing the new British Zip Code [27]. A typical example of the code is NW2 7GL, where NW2 represents a postal district in London and 7GL indicates what part of that district. Errors are minimized by drawing the component letters and

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numbers from sets that are not acoustically similar.

Reversed Dialing

Another feature of short-term memory is that it fades rapidly if your attention is distracted from it. In a study done at Indiana University, people could not even remember three letters six seconds after hearing them, if the six seconds were occupied with counting backwards [27A]. Similarly, after you look up a telephone number, you may forget the last digits while dialing the first ones. Is there any way to improve short-term memory while dialing? Perhaps you would remember the last few digits better if you could dial them first, before the short-term memory of them faded. But then wouldn't you forget the first few digits before you got around to dialing them? Maybe not. The first three digits of a telephone number are often a familiar, well-learned local exchange. They might be easy to remember in spite of the delay in dialing them.

In an experiment, twenty Bell Laboratories employees were told to try dialing the familiar digits (Murray Hill exchanges 582 or 464) last instead of first—2626-582 instead of 582-2626, for example. The outcome was striking: people made *half* as many errors, and were 25% faster, when they dialed the exchange digits last instead first[28]. Moreover, even though these people had been dialing numbers the usual way for years, they voted almost unanimously that they *preferred* dialing in reverse.

When this experiment was carried out several years ago, it seemed unreasonable to ask the Bell System to switch to exchange-last dialing in order to cut down on dialing-time and errors. But recently two of our psychologists have suggested that the advent of electronic switching might make it feasible to offer reversed dialing as a telephone service option. Of course, the idea would have to be explored carefully in more detail in order to ascertain its actual advantages.

Scanning Through Memory

So far we have considered mainly how to store information in memory and then pull it out again. What happens when your task is not to read out something from your memory, but to check an item against it? Questions like: Is titanium one of the metals that Harry is working with? Is this cloud chamber track one of the four kinds I'm looking for? Is milk one of the things my wife said to pick up on my way home? If you think about how you answer questions like those, you will probably say that either the answer just pops into your head, or that you mentally run down the list until you find the item in question. Experiments show that even when you think that is what you are doing, something much more elaborate is going on in your brain.

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In these experiments, people memorize a list of, say, five letters and then are asked whether a single letter is, or is not, in the memorized list. The person presses a button as soon as he has the answer, thus giving a precise measure of how long he took to come up with it. The data reveal that it takes about 35 milliseconds longer to decide whether a letter is in a memorized four-letter list than in a three-letter list, 35 more milliseconds if it is a five-letter list, and so on—35 extra milliseconds for each extra item on the list. The botton line on Fig. 7 shows this clearly. The implication is that some sort of very rapid mental scanning of the list is going on, scanning at a rate of about 30 items per second [29].

This scanning is not the same thing that you think of as mentally running down a list, as you can prove to yourself by mentally running through a well-learned list, such as the alphabet. Even going at top speed, it will take you five to ten seconds [29a]—certainly much more than the one second that it would take if you went at the rate shown on the figure.

The other peculiar thing about the unconscious list-scanning is that it does not behave reasonably, as you think you are behaving. Research indicates that your unconscious scanning does *not* stop as soon as it hits the item it is looking for. Instead, it compulsively runs through the whole list!

Another surprising finding is that it takes *longer* to check through a well-learned list than through an unfamiliar list that you look at just before being asked about a test item. You scan at the same rate whether the list is well-learned or unfamiliar, but there is a measurable delay before you start scanning a well-learned list. Detailed analysis of the data suggests that all of the items in the well-learned list get transferred from long-term memory into short-term memory, one by one, before you start to scan them [30].

Experiments like these also suggest another principle to bear in mind when assigning telephone numbers and other codes. In recalling strings of digits, the most common kind of error is getting the numbers in the wrong *order* rather than getting a digit wrong. The same difficulty with order shows up in two kinds of experiment. One is similar to the list-checking experiments, except that instead of simply deciding whether a test item is, or is not, in the memorized list, people must also determine *where* in the list the test item is. For example, they may be asked to say what item *follows* the test item. The finding is that here, too, a person mentally scans the memorized list before answering. But when he has to determine not only *whether* the test item is in the list, but also *where* in the list, his scanning takes much longer—as shown by the top line in Fig. 7 [31].

A quite different sort of experiment also demonstrates how dif-

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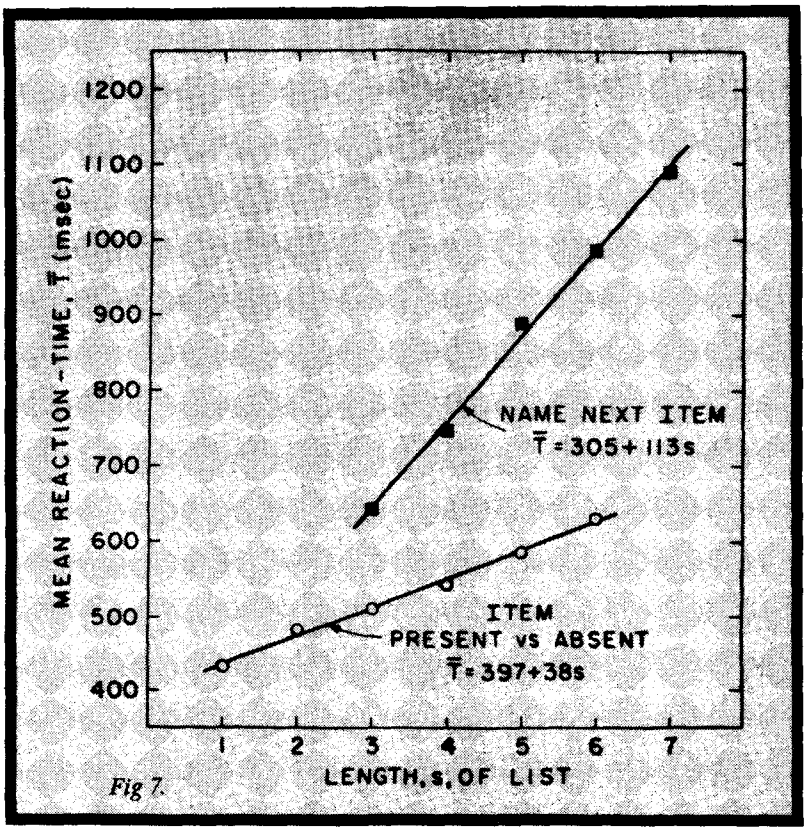

Fig 7.

ficult it is to deal with the order of items. Suppose you watch a sequence of letters, or numbers, being flashed on a screen one at a time. If you are looking for a particular letter, you can spot it even with the letters flashing by at the rate of ten or more per second. But if you try to notice what *order* the letters come in, you'll be at a loss unless the rate is cut to less than half as fast—four letters per second [12].

One implication of these and other studies is that codes can be dealt with faster and more accurately if they are designed to make the order of letters and numbers in them unimportant. Where that is not possible, as with telephone numbers, we can still reduce errors by assigning to often-called telephones numbers that do not turn into other working numbers when the order of digits gets scrambled.

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Psychology and Common Sense

The work on short-term memory brings out something of the character of fundamental research in the Behavioral Research Center. Sometimes it seems hopeless to expect psychology to be a science— people are so different from each other, so complicated and variable. Their mental processes seem so intangible and inaccessible. All of these obstacles are real ones, but with ingenuity and diligence, psychologists have gradually revealed unsuspected features of mental processes. Look again at Fig. 7. It shows that given the right conditions and the right experiments, psychological data can be as orderly and meaningful as data in physics or biology.

Some of the psychological findings that I have mentioned sound like plain common sense—just what any thoughtful person could have decided without any fancy experiments. But I have also noted a number of cases in which common sense ideas are simply wrong, or incomplete, or irrelevant.

The lesson, of course, is that in the behavioral sciences we must resist the urge—as we do in the physical sciences—to rely on common sense and our own guesses instead of on experimental data about how people function. Common sense is very often vindicated by research; it also is very often contradicted; but most important, we cannot tell in advance which cases will turn out which way.

Other Benefits

This discussion has so far dealt with the Behavioral Research Center's research activities. There are three other ways in which the presence of psychologists benefits the Bell System.

First, the psychologists are available for consultation at an early stage in the planning of new programs. For example, one of Bell Laboratories' responses to urban problems and underemployment is a new Laboratory Assistant training program. Four Bell Laboratories psychologists participated in a series of planning sessions for the program. One of them then guided a systematic study of what skills the trainees need in order to perform useful work for Bell Laboratories. The program is relatively new, so we do not yet have any on-the-job evaluation of its success, but there are two indications that the program is working out well. First, although financial problems, draft, and returning to high school, have pulled a number of trainees out of the program, very few have dropped out because of inability to learn, lack of motivation, or poor attendance. This is very encouraging, for the trainees came to us with few skills. The second measure of success is that over half of the trainees who are still with us have already progressed from the new temporary job category, Laboratory Trainee, to the status of Laboratory Assistant. The outlook for future expansion of the program is good, thanks to the care-

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ful planning that went into it.

A second benefit that we derive from the psychologists is that they serve as a sort of scientific "early warning system." They can alert us to new papers that describe discoveries relevant to the Bell System. In fact, our psychologists' participation in professional society meetings and their visits to universities mean that we have a good chance of hearing about such findings months, or even years, before they appear in print. Fortunately, a steady flow of invitations to visit and lecture is assured by our psychologists' enviable professional reputations. A recently published collection of key papers on perception [33] provides one indication of their high standing: Bell Laboratories ranks above all other institutions in the number of its people who have papers in the book.

Finally, a third benefit offered by the psychologists is that, in addition to pointing out and following up relevant research done elsewhere, they directly stimulate such research outside Bell Laboratories. To give one crude index of this influence, a single paper by one Bell psychologist has been cited by non-Bell researchers in more than a hundred scientific publications over the last three years. Others in the Behavioral Research Center have received similar attention. The result is a sort of research multiplier—our psychologists generate much more research in relevant areas than they can themselves carry out.

A Healthy Young Science

Despite the spread of automation, computers, and DATA-PHONE® service, the Bell System still depends on people, both as customers and employees. Yet it is much easier to understand and control a physical environment than to learn about, utilize and improve our human capabilities. That is why research on people's mental processes and behavior, though it is difficult and often frustrating, is of great importance. Experimental psychology is in a young and rudimentary state, compared to the physical sciences. But it is healthy and growing. Psychologists are gradually building up a body of reliable, detailed, and often surprising information about how human beings function [34].

Acknowledgment

I wish to thank M. V. Mathews, director of the Behavioral and Statistical Research Center at Bell Telephone Laboratories, and the people inside and outside of the Center who supplied the information on which this paper is based. I wish particularly to acknowledge the help of S. Sternberg and C. S. Harris, who spent a lot of time editing and revising the paper.

REFERENCES

1. *Rubinstein, C. B., & Pearson, D. E. Some possibilities for the use of white as a primary in color television systems.* J. SMPTE, *1968, 77, 387.*
   Pearson, D. S., Rubinstein, C. B., & Spivack, G. J. Comparison

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ELECTRONIC REPRODUCTION PROHIBITED

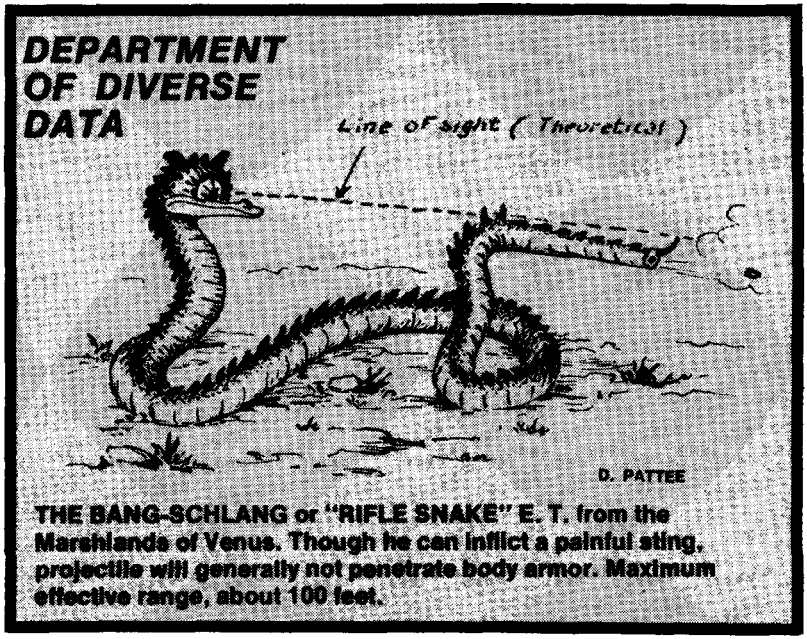
of perceived color in two-primary computer-generated artificial images with predictions based on the Helson-Judd formulation. J. Opt. Soc. Amer., *1969, 59, 644-658.*

2. *Hovland, C. I. Two new social science research units in industrial settings.* Amer. Psychologist, *1961, 16, 87-91.*
3. *Julesz, B. "Texture and Visual Perception."* Sci. Amer. *February 1965, 212(2), 38-48.*
   Julesz, B. & Johnson, S. C. "Mental Holography": stereograms portraying ambiguously perceivable surfaces. Bell Sys. Tech. J., *1968, 47, 2075-2093.*
   Julesz, B., "Foundations of Cyclopean Perception."
   Book in preparation.
4. *Harris, C. S. Adaptation to displaced vision: visual, motor, or proprioceptive change?* Science, *1963, 140, 812-813.*
   Harris, C. S. Perceptual adaptation to inverted, reversed, and displaced vision. Psychol. Rev., *1965, 72, 419-444.*
5. *Rock, I., & Harris, C. S. "Vision and Touch",* Sci. Amer., *May 1967, 216(5), 96-104.*
6. *Holt, H. O. & Valentine, C. G. "An Exploratory Study of the Use of a Self-instructional Program in Basic Electricity Instruction," in* Programmed Learning: *A Critical Evaluation, J. L. Hughes (Ed.) Chicago:* Educational Methods, *1963, pp. 15-39.*
7. *Skinner, B. F. Teaching machines.* Science, *1958, 128, 969-977.*
   Skinner, B. F. The technology of teaching. *New York: Appleton-Century-Crofts, 1968.*
8. *Gustafson, H. W., & Shoemaker, H. A. An evaluation of the efficiency of the instructional program. "Effective Listening." Paper read at A. E. R. A. (Div. C), February 1968.*
9. *Ross, P. C., & Shoemaker, H. A. An evaluation of listening training against job relevant criteria.* J. Nat. Soc. for Programmed Instruction, *1969, 8(4), 14-18.*
10. *Rothkopf, E. Z. Some observations on predicting instructional effectiveness by simple inspection.* J. Programmed Instruct. *1963, 2, 19-20.*
11. *Meyer-Markle, Susan. It Figgers.* National Society for Programmed Instruction Journal, *1965, 4, 4-5.*
12. *Rothkopf, E. Z. & Coke, Esther U. Repetition interval and rehearsal method in learning equivalences from written sentences.* J. Verb. Learn. ver. Behav., *1966, 5, 86-91.*
13. *Landauer, T. K. "Reinforcement as Consolidation."* Psychol. Review, *1969, 76, 82-96.*
14. *Rothkopf, E. Z. The added-parts procedure in learning from written discourse.* Amer. Educ. Res. J., *(in press).*
15. *Rothkopf, E. Z. Some theoretical and experimental ap-*

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

proaches to problems in written instruction. In J. D. Krumboltz, (Ed.), Learning and the Educational Process. *Chicago: Rand McNally, 1965, 193-221.*

16. *Rothkopf, E. Z. Learning from written materials: an exploration of the control of inspection behavior by testlike events.* Amer. Educ. Res. J., *1966, 3, 241-249. Rothkopf, E. Z. & Bisbicos, Ethel. Selective facilitative effects of interspersed questions on learning from written material.* J. Educ. Psychol., *1967, 58, 56-61.*
17. *Smith, M. E., Rothkopf, E. Z., & Koether, Mary. The evaluation of instructional text: Relating properties of free recall protocols to text properties. Paper to be read at American Educational Research Association Minneapolis, March 1970.*
18. *Coke, Esther U., & Rothkopf, E. Z. Note on a simple algorithm for a computer-produced reading ease score.* J. Appl. Psychol., *in press.*
19. *Smith, K. H., & McMahon, L. E. Understanding order information in sentences: some recent work at Bell Laboratories. In: G. Flores d'Arcais & W. J. M. Levelt (Eds.), (North-Holland, Amsterdam, 1970), p. 215.*
20. *Rothkopf, E. Z. Programmed self-instruction booklets, mnemonic phrases, and unguided*


DEPARTMENT OF DIVERSE DATA
Line of sight (Theoretical)
D. PATTEE
THE BANG-SCHLANG or "RIFLE SNAKE" E. T. from the Marshlands of Venus. Though he can inflict a painful sting, projectile will generally not penetrate body armor. Maximum effective range, about 100 feet.

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study in the acquisition of equivalences. J. Programmed Instruction, 1962, 1, 19-28.

21. *Bower, G. H. & Clark, M. C. "Narrative Stories as Mediators for Serial Learning."* Psychon. Sci., *1969,* 14, *181-2.*
22. *Swets, J. A., Harris, Judith R., McElroy, Linda S., & Rudloe, H. "Computer-aided Instruction in Perceptual Identification."* Behav. Sci., *1966, 11, 98-104.*
23. *Rothkopf, E. Z. & Thurner, R. D. Effects of written instructional material on the statistical structure of test essays.* J. Educ. Psychol. *(in press).*
24. *Sperling, G. The information available in brief visual presentations. Psychol. Monogr., 1960, 74, No. 11 (Whole No. 498).*
    Sperling, G. A model for visual memory tasks. Human factors, 1963, 5, 19-31.
    Sperling, G. Successive approximations to a model for short-term memory. Acta Psychologica, 1967, 27, 285-292.
25. *Harris, C. S. & Haber, R. N. "Selective Attention and Coding in Visual Perception."* J. Exp. Psychol., *1963, 65, 328-333.*
26. *Sperling, G. & Speelman, R. G. Acoustic similarity and auditory short-term memory: experiments and a model. In D. A. Norman (Ed.), Models of Human Memory. New York: Academic Press, in press.*
    Speelman, R. G. & Sperling, G. Effect of the sound of stimuli upon short-term memory. Paper read at Eastern Psychological Assoc., Philadelphia, April, 1964.
27. *Conrad, R. "Designing Postal Codes for Public Use."* Ergonomics, *1967,* 10, *233-238.*
27a. *Peterson, L. R., & Peterson, M. J. Short-term retention of individual verbal items.* J. Exp. Psychol., *1959, 58, 193-198.*
28. *Shepard, R. N. & Sheenan, Maureen M. "Immediate Recall of Numbers Containing a Familiar Prefix or Postfix."* Percept. Mot. Skills, *1965,* 21, *263-273.*
29. *Sternberg, S. "High-speed Scanning in Human Memory."* Science, *1966,* 153, *652-654.*
29a. *Landauer, T. K. Rate of implicit speech.* Percept. mot. Skills, *1962, 15, 646.*
30. *Sternberg, S. Memory-scanning: Mental processes revealed by reaction-time experiments.* American Scientist, *In press.*
31. *Sternberg, S. "Retrieval of Contextual Information From Memory."* Psychon. Sci., *1967,* 8, *55-56.*
32. *Scarborough, D. L. & Sternberg, S. Processing items and their order in sequential visual displays. Paper presented at the meeting of the Eastern Psychological Association, Boston, April 1967.*
33. *Haber, R. N. (Ed.) "Contemporary Theory and Research in Visual Perception." New York: Holt, Rinehart and Winston, 1968.*

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HEART'S DESIRE and OTHER SIMPLE WANTS

Given infinite mobility, you have absolute immunity. But if there is a place you want to be— thereby you're limited!

W. MACFARLANE
ILLUSTRATED BY VINCENT DIFATE

Ravenshaw met General Craddock in a scuzzy bar in Saratoga Springs, New York, downhill from the main street. The smell of winter was in the air, though the day was bright blue October and the trees were yellow and blazing red. Ravenshaw said that Indian summer was the best time of the year in the far east and he was glad to get a look at it. Craddock said that was nice because he was going to have an opportunity to study this one.

"Through no fault of your own, you've become a marked man, Ravenshaw. I thought my operation was secure with baffles, dead ends, double bluffs and a chain of command trustworthy as a paperclip necklace. I figured I was safe as the missing side of a Mobius strip. I was mistaken."

They were alone at a table. The other patrons, men and women of middle age and over, preferred the bar stools. The place was a home away from home for pensioners and retired people. A blowzy grandma said, "Now, the first time we met was in an oat bin—" and Ravenshaw lost the rest in the easy laughter.

Craddock rubbed the bridge of his nose with his glasses. "Consider what happens when a black box turns up, an alien artifact that works on unknown principles. A little later, one hundred eighty-two alien modifications to household appliances are made available for study. Oh, they don't know your name, or where all this happened, or when but we have some very hairy tigers prowling the corridors of power. They have keen noses. They have sharp hearing. They have lively imaginations. One of the items modified in your Cloud-cookoo-land was a portable radio. The battery looks like one you can buy in the radio shop around the corner, but it turns out to be a fuel

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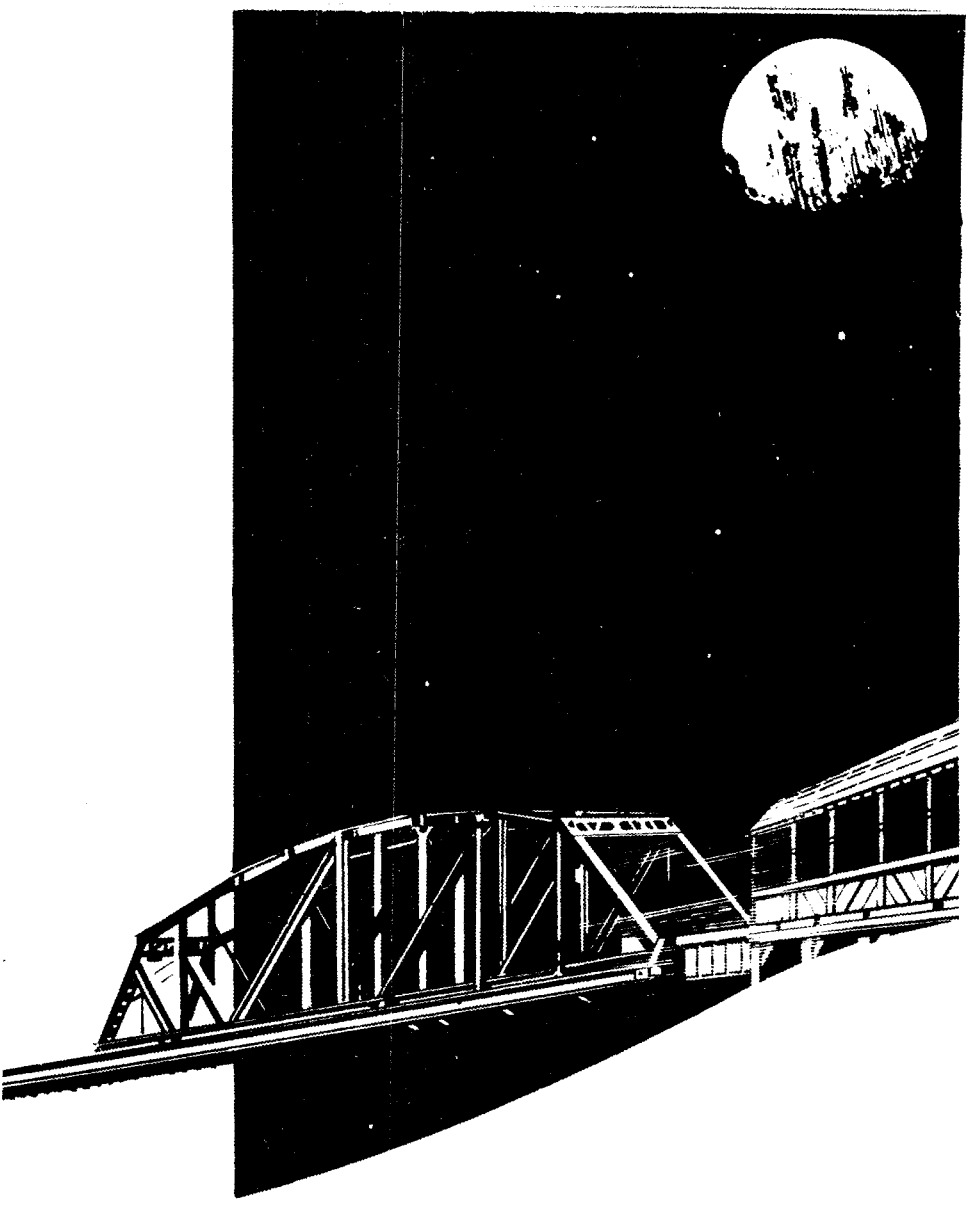

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cell. It manufactures electricity to meet the demand. Enough energy in a teacup of water to shove Queen Elizabeth II across the Atlantic, is that it? With no radiation. It has a bunch of MIT people eating tranquilizers like olives."

Ravenshaw held up the empty bottle and caught the bartender's eye. The general had not touched his Scotch and water, but Ravenshaw was suddenly thirsty. His mouth was dry.

"They tell me one job in eight depends on the automobile," said the general as the bartender brought another Genesee. "Service stations and pipelines and drilling crews, you name it." The bartender was back at work listening to an old lady with a wicked cackle. "Just suppose you are a tiger and you hear this kind of goat

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bleating somewhere. It would stand the economy right on its ear. What tipped me off to the tigers was Molyeye—that's Molybdenum Industries—when the stock began to edge up against market. They're a primary producer of cerium oxide, and one of the MIT people said it's a major component of the fuel cell. I know this tame stockbroker with a nosey disposition and computer software to spot anomalies."

"They're going to run cars on this thing?"

"Not tomorrow," said Craddock. "We've got hold of the wrong end of the stick." Ravenshaw looked puzzled. "Application depends on technological breakthrough from a discovery. The educated guess was that astrophysics would be the field for the next quantum jump in knowledge. Questions are developing faster than answers, especially in the area of high-energy particles. We've got the fuel cell hindside-to. There's no provenance for this baby. What could Archimedes do with a brand-new Ford engine? I'll tell you something—no I won't. Your need-to-know is that tigers are snuffling and I need lead time to make deadfalls and false trails. I don't want some smart tiger pumping you full of lauryl compounds, or tricyano-aminopropane."

Ravenshaw tapped the empty bottle on the table. The bartender brought him a full one. The general looked comfortable in an old houndstooth jacket and a dull maize shirt open at the throat. Ravenshaw was sweltering in lightweight Harris tweed. He poured beer into his glass and raised his eyebrows.

"Truth drugs," said the general, putting on a different pair of glasses. "It's nice to see you, Arleigh. What's been going on at your store?"

Ravenshaw had flown from San Diego to Philadelphia to Albany, rented a car and drove to Saratoga Springs and found himself in an imaginary jungle where tigers lashed their tails down marble corridors. He took a swallow of beer and reoriented himself.

"Well, a viscous fellow came in with an oil additive colored expensive. His suggested price was $16 a gallon and the stuff turned out to be polyisobutylene at 95¢ a gallon wholesale. It does improve viscosity, but it plugs small oil passages. Another man brought in a new kind of modesty panel for buses. Another man had a crowd-control device that made plastic balls to upset rioters. He had a working model in his garage. When I went to look at it, he couldn't turn it off. It spit out balls like shelled peas—kind of comical to see a garage fill knee deep with instant hollow marbles. The base gloop was insoluble in water and that plugged things up a little. I sent him to Attico. Maybe they can make something of it." The general listened politely. "Then I hung up a new record, four people in a row who might as well have been talking

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Swahili—one medical, two electronic and one chemical. They got a song and dance. They left the stuff with me to shove along. I guess I have an honest face."

"Never trust an honest man. He's only fooling himself. What is a modesty panel?"

"Keeps you from looking up women's skirts."

"You're too old and I'm too moral." The general smirked and dismissed the subject. He patted the attaché case at his side and got down to business. "In the cloak-and-dagger trade they have found the best way to hide is not to hide, but outside your frame of reference. I want you to go away for a couple of months. By that time I'll have some goats staked out. I'll build a hookah in a tree. I'll dig a tiger pit or two."

"Um . . . I think you smoke hookahs."

"I smoke tigers."

The hair raised on the back of Ravenshaw's neck. There is nothing as shocking as naked purpose. For an instant he had seen an electric arc in Craddock's eyes. He felt sorry for tigers.

"I also belong to the Pollyanna school of philosophy. For some time now, I've maintained a file of names and addresses to be investigated, granted the proper man to do the job. When Pollyanna broke a leg, she was thankful she hadn't broken the other. Trademark registered: The Glad Girl. Figure me as the Glad Girl. What are you snorting about?"

Ravenshaw shook his head.

"I want you to interview these people across the country. You will write a report to an accommodation address in Alexandria, Virginia after each visit. I'm not after in-depth information. What I want is judicious opinion. Do they have anything we ought to look at, or is it all self-delusion and pig swill? Your name is Humphry Caddis. There are credit cards and money and supportive evidence in this briefcase. Send your Ravenshaw identification to Alexandria."

"Yes, sir. Meanwhile, back at the ranch?"

"While I'm heading off rustlers at the pass—yes. I have a young man to hold down your office in San Diego. He will put out word that Arleigh Ravenshaw is down the west coast of South America on a survey contract for the frozen fish industry."

Ravenshaw smiled faintly. "How about Nell Rowley?"

"Show me your need-to-know."

"How do I travel?"

"Return your rental to Albany. Take a bus and buy a car in Utica, or Syracuse. Sell it for another in three to four weeks. When you get to Salt Lake City, do it again."

"What's my excuse for talking with these people?"

"You're an investigator for the Sneddiger Foundation of Reno, Nevada. There's a precis in the briefcase. What you'll be investigating is

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paranormal phenomena." The general smiled at his expression. "What's the motto tattooed on your heart today, Colonel Ravenshaw?"

Ravenshaw tapped his bottle on the table again. "Work is the curse of the drinking man."

Arleigh Ravenshaw had a degree in engineering from the University of California at Berkeley, paid for by the US Army in a paroxysm of self interested generosity that flourished briefly after the Korean War. Some educators deplored his politically apathetic generation, but Ravenshaw had time to speculate with other collegiate philosophers on such chestnuts as: "If you were sitting in total comfort in front of an open fire and suddenly knew you would die if you did not get up in thirty seconds, would you bother?"

His answer had been "Hell, yes!" but after his wife died, he stayed in the Army at least partly because someone was always rousting him out of that armchair. He had thought his special assignment to Wide Blue Yonder, Inc., was a good solution to this deep personal apathy, but as he drove away from Saratoga Springs, he wondered if he had not been cozy and comfortable as a birddog in a nest. There had been a few lively moments when he tangled with the infinite worlds, but by and large, he had dug into a comfortable routine.

He spent the night in Albany, caught an early bus to Syracuse and bought a 1967 Chevrolet in very fair condition for $1,295. He drove west filled with sober delight by the fall coloring. Autumn was always a time for new beginnings. The weather was invigorating after the long summer, there were football games and burning leaves, and the purple haze made the far hills and the future mysterious and promising.

He found a bookstore in Buffalo and by the time he fell asleep, he had refreshed his memory on such terms as clairvoyance, telepathy and precognition. The books reinforced his opinion that extra-chance causation did exist in fact, but that the extrapolations were on the order of a TV mast three hundred feet tall resting on a factual bearing.

The first address on General Craddock's list was near the waterfront. It was a narrow building between two larger brick buildings and the name was Commonality Boutique. A bell tinkled as he pushed open the door and walked in. The shelves and islands and counters were second-hand or homemade and the twelve-foot walls were covered with paintings and charts.

There was a slap of sandals down the hall and a girl in a loose blouse and blue jeans said, "Good morning." She had a year-old baby on her hip. "You're today's first customer," she said, "so you're lucky. Got to sell the first customer. Lots of bargains. Halloween is only three weeks off."

"I'm just browsing," said Ravenshaw, "like Nebuchadnezzar."

"Grazing on the fields of Baby-

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lon," she agreed cheerfully. "Help yourself." She was a rosy girl with long taffy hair and a wide Dutch face. She hoisted herself and the baby to a countertop "How about a blackberry vine?" She pointed to a tangle in a corner. "Dug them up last weekend for the Irish trade."

"What do they want with blackberries in October?"

"If you crawl under the trailing branches of a blackberry bush on Halloween, you'll see the shadow of the girl you're going to marry. Or, if you call on the Prince of Darkness while you're under the tendrils, you'll have luck at cards."

"Gee whillikins," said Ravenshaw.

"Oh, sure. And you'll notice there aren't any berries on the vines we selected. If you pick them after the 11th of October, you're asking for trouble. The Devil spits on blackberries on the 11th—don't ask me why—and if you eat them after that, the blackberry is so insulted that you will suffer grave misfortune. Ralph Nader would approve of us. We protect the customer."

A man appeared in the hallway. "Bess, where's the hammer?" He had a high forehead and a large nose. The rest of his head was covered with hair except for his mild blue eyes peering through a pair of granny glasses. "Are you finding what you want?" he asked Ravenshaw.

"If you're traveling," said the girl, "how about a charm for your car? It saves a great deal of money in repairs and we've just got in some very nice iron bangles from India. They're a general charm, nothing specific, but we ran a frequency of repair record with them in Chicago and they checked out first class."

"Perhaps you'd get more value from a plastic Mithras on your dashboard," suggested the man. "They're of my own casting and have alnico magnets in the base. I can guarantee the intent but not the ritual, because what do you choose? Mithras as a Persian angel of light who fights on the side of Ahura-Mazda, or the much later German god in the Rhone valley? He was always a warrior and women were pretty much excluded for a universal religion, but until Dacia fell—"

"Oh, Will, let him decide whether he needs material, or spiritual protection," said the girl.

Ravenshaw thought it over. "Maybe I need both." He bought the ring and the dashboard god, four inches high with gold flecks in the creamy yellow plastic, and a phrenological chart to send to General Craddock. "How did you get into this business?" he asked.

"A nice girl like me?" said Will. The blue eyes were alert as well as mild. "I was a student of comparative religion and Bess is a cultural anthropologist. Our first venture was in Chicago before we were married. We called it the Other Gods Shop, and really did quite well. There does seem to be a fund

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of good will residual in neglected gods. I imagine they appreciate any attention they get. When Bess inherited this building, we moved to Buffalo. There's great ethnic diversity here and we cater to it. There are Poles and Germans, and we're on the edge of the Italian colony. The Hungarians are in Black Rock and the Negroes around Jesse Clipper Square. We changed the name to offend no one, and to indicate glancingly at least, our fundamental interest."

"And what is that?"

Bess said, "Effectively, we have one society in the world today. This is the time of confluence and all the other cultures are joining the western mainstream. It's very sad. We want to establish commonality before it's too late."

"Don't you agree," said Will, "that new ethnocenters are being created? The Blacks, the Mexicans, the Indians, the communes of New Mexico?" This was evidently a running discussion and Ravenshaw pointed out that they were in accord except for terminology. They cheerfully jumped on him and agreed he was a semantic illiterate. "You've got to have a variety of viewpoints," concluded Will, "before you can find the least–and most–common denominators."

"What are they?"

"Birth, and life, and death. To assuage the mysteries, we have superstition, magic and the supernatural. One commonality is that the brute facts are ridiculous, but become significant with an act of faith. I assume, sir, you are agnostic?"

"It's not proven. Let me answer with an unequivocal yes and no." The man chuckled with an insucking of breath through his nose. Ravenshaw had long ago discovered the use of impertinence. Answers either way were informative. "Why all the whiskers?"

Bess said, "You can't imagine how exciting it is to love Karl Marx, Rex Stout and Henry Wadsworth Longfellow rolled into one!"

"I think it's a disguise," said Will seriously. "I'm free to do outré things hidden in this brush. I fool myself and impress the customers. Look at all the people who hide behind dark glasses and talk about protection from eyestrain. Anybody who wears cheaters puts his personality on his nose."

Ravenshaw laughed aloud. Glasses as a disguise, a character indicator, was a new idea to him and he was pleased with it. "Do you believe all this stuff, then?"

"K is P," said the girl, "no matter how thin you slice it."

"K is . . . oh. What do you want with power?"

"More knowledge," said Will.

"It's the name of the game," said Bess. "How about a nice postcard of the Leon F. Czolgosz memorial? He's the poor idiot who shot McKinley. Bronze tablet set in a rock. Send one to a friend. More K."

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"K is no better than its use," said Ravenshaw. "One more question. How about the nasty parts? You have medallions and good luck charms and books about witchcraft and Atlantis and how to pick herbs out of woods. You've got scarabs and skeletons and pumpkins and masks. Look at all you've collected—does it run to bat wings and toad blood and mummy dust?"

Will laughed his snorting chuckle. "I can get you mummy dust—cat mummies or ibis—from a specialty house in New Jersey, but there's not much call for it. We try to stock henbane and dried parsley—if Bess doesn't put it in the soup—and rowan twigs, but witchcraft is pretty much a do-it-yourself business."

"What about covens and esbats and sabbats?"

"Group lunacy is not our bag," said Bess.

Will said, "Like everything else these days, magic is specialized, compartmentalized until you wouldn't believe it. We are really Other Gods experts. Bess is admirable on superstitions. We can do you some nice things in the Egyptian line and in the Greek pantheon and a little less certainly in Sumarian gods—"

". . . And one day we hope to become facile in all that great crowd of pre-Columbian dieties," added Bess.

". . . And Wotan and Baldur and Thor. Uh-oh. Bess, where is that hammer? I've got to open that new keg of horseshoes."

"Pony shoes?" asked Ravenshaw.

"Of course," said Will. "With pony shoes you get more to the pound. A fine, useful superstition."

Ravenshaw drove down to Altoona, Pennsylvania and made an appointment that evening with Melitrice Leonore Morck. She received him in a beaded black dress, an unusual little woman with china doll eyebrows and absolutely black hair parted in the middle and braided over each ear. Ravenshaw guessed her age at sixty, her height at sixty inches and her bust measurement about the same. She had the trick of looking at the tip of his nose rather than meeting his eyes, and her voice was oracular, dim and hollow. He wrote to Alexandria, Virginia: "She is an expert in Affectional Relations, Biorythm Charting, Yoga Body-aids and the Love Sutras of Devarsi Narada. The most remarkable thing about her is that she can sit up by herself. If that buzoom was laid end to end, it would take ten minutes to pass a given point. I'm off for West Virginia in the morning."

Charleston was sodden with rain and the barber who cut his hair in the shop around the corner from the state capitol was lachrymose as the day. He brightened at the idea of Reno and Las Vegas, and when Ravenshaw mentioned his job with the Sneddiger Foundation, he stepped to the front of the chair and invited Mr. Caddis to a meeting of the Futurian

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Society and a demonstration of the only proven method of divination, alectryomancy. Ravenshaw said the Foundation was looking through all types of windows to the future, and he appreciated the invitation.

He spent the rest of the melancholy day in the basement museum at the capitol, and over in the library. Finding out about Mad Ann Bailey's apocryphal ride for ammunition cheered him a little, but his research into the mystical areas into which he seemed to be drifting was thoroughly depressing. It was the most turgid body of special pleading he had ever seen, whether Nineteenth Century or modern. He met the barber that evening with the gloomiest anticipation.

They drove through persistent rain to an old house raddled with orchid paint where they were greeted by the other members of the society. They gathered in an upstairs room where a lettered board was laid out in a circle of chairs. A few grains of wheat were placed on each letter. A black Minorca cock was allowed to pick the grains and the selected letters were recorded. After each member of the group had a turn at handling the fowl, they went downstairs to tally the results over coffee and cookies.

". . . And the women in wash dresses smelled of Fels-Naptha. They were chicken bright and revelation eager. The oatmeal cookies had flour pockets and hard raisins. After some clerical difficulty, my reading by the black Minorca was A-F-A-H-M-A-S-P, which was interpreted by means of a cabalistic chart as follows: 1) I am going on a long trip. 2) Watch out for the wiles of women. 3) Beware of misguided superiors. I expressed by amazement and thanked the alectryomancists. My own interpretation was somewhat different: A Fool And His Mind Are Soon Parted."

He drove south and west over wooded hills on crooked roads to Nashville, Tennessee. The man he met there was Roger Muldoon, a chemistry teacher at a suburban school. He was fat and suspicious. His wife had a mouth like a small prune. They spoke favorably of simple virtues but were not opposed to high living. They were carefully not impressed by the Dinkler Andrew Jackson Hotel. They were sophisticated and agreed to cocktails before supper. They drank red and white wine with the meal. Coffee with an application of Wild Turkey in Ravenshaw's room, while they inspected his credentials, made them almost affable.

The conversation dealt chiefly with the inequity of large corporations in connection with various inventions Muldoon had developed. While he was reticent about his brain children, he was happy to tell how he foxed the big companies. What they did, he explained, was to make copies of his papers before they mailed them black with hypocritical regrets.

At first he was satisfied with send-

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ing out his material in white type on a bright red background. This was better than blue ink on orange paper. Further investigation of duplicators led him to work out a heat sensitive coating that was also activated by any unusual magnetic field. His voice slurred and his wife giggled in a refined way. Ravenshaw agreed it was hilarious to set copying machines afire. He wrote Alexandria: ". . . He wouldn't talk about the shoot-around-the-corner gun mentioned in the precis. Or the booby trap revolver. He does not think the paper is important. I suggest further inquiry."

He crossed the hills again to Chester, South Carolina. An earnest retired professor and his wife were printing Tarot cards on a flatbed press after the classic patterns of Etteilla, the Parisian, the German, the Tarot of Vergnano, and they were especially pleased with an original they called the Tarot of Chester. It was up-to-date and very successful, they told him. The Devil was in Madison Avenue uniform, the Moon had a lunar module on it, Death was hitchhiking, the Hanged Man was hung by a Freudian slip and the House of God was Swedish modern. Ravenshaw learned more about cartomancy than he ever wanted to know.

From Chester he drove through Georgia into Florida and found that a magic alligator repellent of wide local repute worked chiefly because poachers were shooting up the alligators. He crossed the state to Sarasota and interviewed Centcotl, a handsome girl at New College who was the Mexican Corn Goddess "reincornated" he wrote dismally.

There was a happy group in Tallahassee swapping wives on the basis of molybdomancy. This involved pouring molten lead into a bucket of water and pairing off on a system of touching points.

Near Birmingham, Alabama he found that a local weather prophet had a shortwave radio, and in New Orleans he met a man who spoke Blaneo. His name was Flournoy Duque and he wore high button shoes. He was busily translating Lorca to Blaneo and insisted on reading selections aloud. By keeping his mouth shut, Ravenshaw learned that Duque had compiled a forty-three thousand word dictionary, a grammar and a basic vocabulary a child could learn with a week's application. Duque was the only man in the world who spoke the language, because he had industriously constructed it himself.

Driving up to Natchitoches, Ravenshaw composed a number of opening paragraphs for a letter he wanted to write:

"General, these people are crazy. I don't mind getting shot at from time to time in line of duty, but this is like stewing in a pot along with sweet and sour pork chops—"

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". . . So I consider this assignment cruel and unusual punishment. My stomach hurts. While I do not want to interfere with your paper tiger hunt—"

"Damn it, sir! Let me go to Mexico if I've got to stay out of sight. I'll cut over at Matamoros, or Laredo, or McAllen, or Eagle Pass. I'll buy a *jipi* wig and grow a moustache and wear a pair of funny-looking glasses—"

". . . It's nutty as a tree of pet coons around here and I hate to think what I'll find farther west—"

". . . I am prejudiced about a lot of things. There is no tolerance in me. I have an unconquerable bias toward rationality—"

". . . Don't care how many people believe the world is flat. I don't care how many people know the sun goes round the Earth. I don't care how many believe fossils were created in 4004 BC at 8 o'clock on a Wednesday morning. But I do care if I have to associate with them—"

He got a room at the Tauzin Motel, discovered the town was called Nak-a-tosh, and phoned Mrs. Aubrey Chalmers. Her voice curled right around his ear as she gave him directions to her house, some miles out of town. She suggested he drop in at nine that evening for a drink. She would be happy to discuss the modern application of witchcraft at that time.

Ravenshaw whistled softly. He got into his car and drove to a garage. He said he needed a grease job, an oil change and the front wheel bearings packed. In the meantime, he had an errand to do. Could he rent a car? The garageman said hell, take the jeep. It was a relic of World War II with a tin top added, ravaged from a pickup and beat to fit.

The subtle southern glaze to her speech and the consonantal softness had raised the hair on the back of his neck. He knew he was in the south. Grits and red-eye gravy with breakfast convinced him of it. Chicory-flavored coffee drove home the lesson, but he had been touching a magnet to pot metal for the past weeks, and suddenly found iron. He would follow his hunch with a quick reconnaissance before dark.

He turned off the blacktop onto a dirt road through bottom land covered with yellow grass and desolate black pine stumps. There were a few isolated breezeway shacks near town, but it was lonesome, cutover country. He passed a drive marked Chalmers Farm that led to a ridge covered with second growth oak. He drove on without slowing and a mile farther on, found a pair of tracks through the weeds leading off to the right. The terrain was more irregular past the ridge and he realized he was driving on top of an old logging railroad bed. Long forgotten spur tracks joined from time to time. The rails were gone, the ties were powder and the roadbeds went on to nowhere.

The wheel tracks abruptly turned downhill and made their own way across a dry meander that had once

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been spanned by a bridge. On the other side was a clump of gums and persimmons left by the loggers fifty years before. He backed the jeep into cover and went through the patch of woods on foot. He stopped while he was still screened. A thousand yards away a long modern house faced the east just under the crest of the ridge. A grassy meadow below the house had been mowed to serve as an airstrip. A blue and white Aero Commander was tied down at the foot of the ridge near a limp windsock. To the south was another abandoned roadbed. Maybe the country had been logged off eighty years ago, thought Ravenshaw. He shivered. There is nothing more desolate than ravaged land.

Close below him in the middle of a stump orchard, was an abandoned community, melancholy in the last sun, the store, the church, the four houses leaning in different directions. It was a still, cold evening. There were tiny orange persimmons on the trees. Ravenshaw picked a couple and puckered his mouth on the long drive back to Natchitoches.

He had a lonely supper, returned to the Tauzin and read fifty more pages of "Life On the Mississippi." Reading was the best way he knew to clear his mind, to get quick distance on a problem. He opened his attaché case and checked the aluminum frame .32 that hid in the battery-operated tape recorder. He put it back. He had a theory that handweapons limit the intelligence of the man who carries one in his pocket. If you rely on an automatic for a final argument, you are blind to alternatives and rest your case on a mental Maginot.

He drove to Chalmers Farm. He followed the road to the ridge and parked between a Chrysler and a 220 Mercedes sedan nosed to a low berm overlooking the airstrip. Mushroom lights led from the parking to the entry of the house. It was flagged with travertine and a planter stood beside the door with a six-foot bronze tree in it, the branches inhabited by a host of bronze owls. The door was cypress and the woman who opened it wore a short orange dress, smoky black stockings, orange shoes and a black velvet band in her red hair.

"Ah do think it's pleasant you could come, Mistah Caddis. Ah want you to meet a few friends and we'll discuss youah preoccupations in front of the fiah." When he took her outstretched hand, she tucked it under her arm and led him to a bright handsome room with the furniture in winter arrangement. A twelve-foot beige leather sofa faced the fireplace and Mrs. Chalmers introduced him to Estelle Page and Rance Logue, a couple of ragglety-taggle Arkansawyers who had flown in from the rice country. The woman was doll petite but her eyes were old, and the man looked like General Custer enlarged to play professional defensive end, six foot four with an exuberant moustache and long, coarse yellow hair.

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Three men were standing in front of an open bar set into the pecan wainscot walls. They were Warren Launder, Mickey Arbios and Lloyd Wick Wooley, deah friends from New Orleans and Houston. Launder wore a ruffled shirt under a handsome Royal Stuart jacket, Arbios was dark and courtly with a hairline moustache, and Wick Wooley was in dove gray with burnished cowboy boots.

They were the pretty people.

They scared Ravenshaw. He saw them as the American dream fulfilled and betrayed. If you set an ultimate goal of money and leisure– and achieve the goal–there is no place to go but sideways into some very odd swamplands. They were courteous and friendly, but there was a low-order fever in these people, a febrile tension like the mist that was gathering in the bottomlands. He said brandy please, and Arbios poured a finger into a balloon glass from a bottle with an unfamiliar label.

Two women came into the room from another part of the house. One was big-boned and deep-breasted with angel wing eyebrows and sweeping dark brown hair. The other was smaller, a palomino with violet eyes. Ravenshaw forced himself to swirl the brandy gently in his glass. He tasted it and raised his eyes. Arbios smiled at his pleasure and said it was thirty-year-old private stock from Pyrenées Orientales. He held an interest in the vineyard and the winery.

Aubrey Chalmers tugged Ravenshaw away and introduced him to the newcomers. The large woman with the delicate complexion was Elizabeth Kinnison from Dallas and the palomino in mauve was Nell Rowley from Houston. They were guests of Mickey Arbios at d'Olivet Plantation on Cane River, along with Wick Wooley.

His hostess steered Ravenshaw away from the two women. "You were positively gogglin' at Elizabeth, Mistah Caddis."

"One of the most beautiful women I've ever seen." He sipped the brandy. "A face to fascinate Caesar and ruin Mark Anthony." She made a moué with her wide brown-red lips. "You madam, are the most piquant."

She gurgled. "McIlhenny's Tabasco from New Iberia? Ah, Mistah Caddis, youah puttin' me on. Come and rest you'self and set a label to mah othah guests." She put him in the middle of the sofa, scuffed off her shoes and settled beside him with her feet stretched out to the low malachite topped table.

"And I thought hospitality was southern fried chicken," said Ravenshaw, "with maybe sweet-potato pie for dessert."

"Ah like to oblidge wayfarin' strangers."

"Even when they ask questions for the Sneddiger Foundation?"

"Oh, you see, I know who he is. He owns the Golden Man in Reno,

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Vegas and Tahoe, Mistah Caddis."

"Still, it's kind of you to indulge his proxy. The old man is without kith or kin and his overwhelming passion is still gambling. Over the years he's seen extraordinary runs of luck—both ways—and he's putting his money into a foundation to check it out, to investigate paranormal phenomena. It's about like putting your finger on a bead of mercury."

"What's kith?"

Ravenshaw brushed her cheek with his lips. "Friends," he said, "neighbors, acquaintances." The brandy was of the very first chop. "By extraordinary, I mean a young couple going to school at Berkeley. They drove their little old Renault to Tahoe once a month to get rent and grocery money at roulette. They hit one club each time and when they won five hundred dollars, they quit and went back to school."

She purred, "Kithing is a nice way to make friends. Continue with your story, suh. Nobody wins at roulette—but the house."

"Well, these two did until she got pregnant—" Ravenshaw went on. He was pleased to have his mind occupied with the bright eyes of the red-headed witch. He had been goggling at the big woman all right, but that was to keep from goggling at Nell Rowley. He was a fair country liar and a good lie is firmly mixed with truth. He had looked at Nell and his heart went into a full broadside skid. So he goggled at Elizabeth whoever-she-was.

Nell Rowley was his secretary at WBY in San Diego. She was an inordinately able woman, a behavioral psychologist with a mysterious background of experience in the infinite worlds—which she disremembered. Her hair was never quite tidy, she wore clothes designed by a misogynist, but tonight all the loose ends were tucked in and she was so lovely his teeth ached from the stress of turning away from her.

What was she doing here? He was beginning to feel like a woolly lamb at a convention of Lions International. Every person in the room smelled of reckless individuality under control, of taut authority like a Venus fly trap waiting to snap on an attracted insect. Was he bug, lamb, or man? Bug, because he would have to flee.

"Funny, honey-pie?" asked Aubrey Chalmers.

"The woman with the fly in the amber ring," said Ravenshaw. "When she wore this talisman, it didn't matter how they set the ten-cent machines. She milked them. And lost it all on anything else she played. Mrs. Chalmers, let me go get my tape recorder. It's in the car."

"Sit cozy. Ah can't be a blabbahmouth, sweetie pot, until you know enough for me to blabbah sistahwise. You been up and down the countryside gatherin' up smidgens of knowledge, but youah forgettin' tonight's Halloween. It's not apple-bobbin' night for grownups, Honey lamb. It's not tricks, or treat-

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in'." She stared at the quiet oak fire. "It's witchin' night, Humphry."

Drag it into the open. Ravenshaw said, "I thought it took thirteen people to make a coven."

"It depends on the ordah and discipline." She turned to him. "Lookit heah, Humphry. Do you believe?" She stared into his eyes. For the first time Ravenshaw saw how asymmetrical was her face.

He cleared his throat. "Yes, ma'm, I do."

"Ah can see you have studied these mattahs somewhat, and Ah am Ipsissimus. In all sobriety now, are you prepared for initiation this very night?"

Ravenshaw gulped and looked around the room. The pretty people were like a circle of wolves, Launder, Arbios and Wooley, Estelle Page and Logue, Elizabeth what's-her-name and Nell Rowley.

"Yes, m'am," he said.

Preparations for the sabbat seemed to consist of keeping the glasses full. Ravenshaw was unable to isolate Nell Rowley. Rance Logue, the Arkansas husky, found his company attractive and they talked flying and farming. People left the room and came back and Ravenshaw was neatly herded from one person to another with Logue always nearby. Aubrey Chalmers was gone. Logue was gone, leaving him with Warren Launder who was an importer at the free port in New Orleans and talked of international transshipments and the problems of manufacturing in bond.

Logue returned with his eyes bright and led Ravenshaw to the entry hall. He opened a door and waved him through heavy drapes into a dark room. It was thick with incense burning under a stuffed goat head with illuminated yellow eyes. Bock beer, thought Ravenshaw with very necessary irreverence. It was an impressive place. There was a carved alter alive with phosphorescence and decked with the paraphanalia of witchcraft, tiny silver bells, knotted cords, pots of ungent and upside-down crosses.

Aubrey Chalmers was busy at one side with a cloak thrown over her head. "'Bout ready, honey?" she said. The door opened softly behind Ravenshaw and closed again. "Drink this an' we'll go down to the old church for the midnight initiation." She held a whip with plaited silk thongs in one hand and handed him a stone cup with the other. The contents were bubbling. Ravenshaw did not think it was Alka-Seltzer.

It was snatched from his hand. Nell Rowley threw the cup and contents into the witch's face. Aubrey Chalmers screamed and blundered into the altar.

"You damn fool!" said Nell. "Let's go!"

She flung open the sanctuary and pulled Ravenshaw out. They ran to the front door. Logue blinked and started for them, but Nell had the door open and Ravenshaw slammed

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it in his face. Nell tugged at the bronze tree. "Help me!" Ravenshaw swung his weight against the planter and it toppled in front of the door as Logue charged into it. "Your car," said Nell, and ran down the path.

Nell was in the seat beside him. The engine caught. A shotgun bellowed from the door of the house, *ka-chow!* Shot rattled against the car. And again. Ravenshaw nosed downhill over the berm toward the airstrip. He turned on the headlights and dodged two trees. He nearly hit the airsock standard and swung away from the Aero Commander.

He heard cars starting up the hill and shouted "Hush" at Nell, who was muttering something about a "fly-by-night strumpet player" he thought might apply to him. There was no chance to head for the road. The coven had the shorter run. He turned south and picked up speed on the airstrip. A ground mist fuzzed the headlights and played hell with his sense of distance. The mist skimped out momentarily and a streak appeared on the hood. He heard the rifle shot and swung up onto the old logging roadbed. The fog closed down again.

Nell said, "I'll not have you spoiled after all the trouble I've been to."

The tracks cut sharply away from the roadbed down a dry stream through irregular brushland to a Y. He turned left and followed the trail over rough country through the fog.

"You play with tar, you get tarred," said Nell, hanging onto the door handle as the car lurched and scrambled.

"All right! How come you can play with people like that?"

"Because I'm innoculated against this kind of loathly disease! What are you doing here?"

"Enterprise, dammit! Sheer outstanding eager-beaverness."

They came to a crossroads and he took the left-hand track again. The fog was thicker even as the road turned more dissolute on an upgrade, staggering through trees, breaking a crest and zigzagging into an open patch of ground. A blank-eyed house suddenly loomed ahead and Ravenshaw hit the brakes.

"Halloween," he said. All the house needed was a jack-o-lantern in the window and a broomstick leaning against the front door to be a proper witch's abode. The road jogged around the house and ran across a field of sere yellow grass.

"Why did you kiss her?" Nell was not about to let the subject drop. "That woman's not exactly the Good Witch of the South, you-all." She sniffed. "One eye is bigger than the other—that bottled red hair—what a charming little misshapen coral snake!"

There was a patch of hard clay and gravel in the field. Ravenshaw stopped and backed for a hundred yards until the treeline encroached. He snapped off the wipers and the lights and turned off the engine. Waterdrops fell onto the trunk, con-

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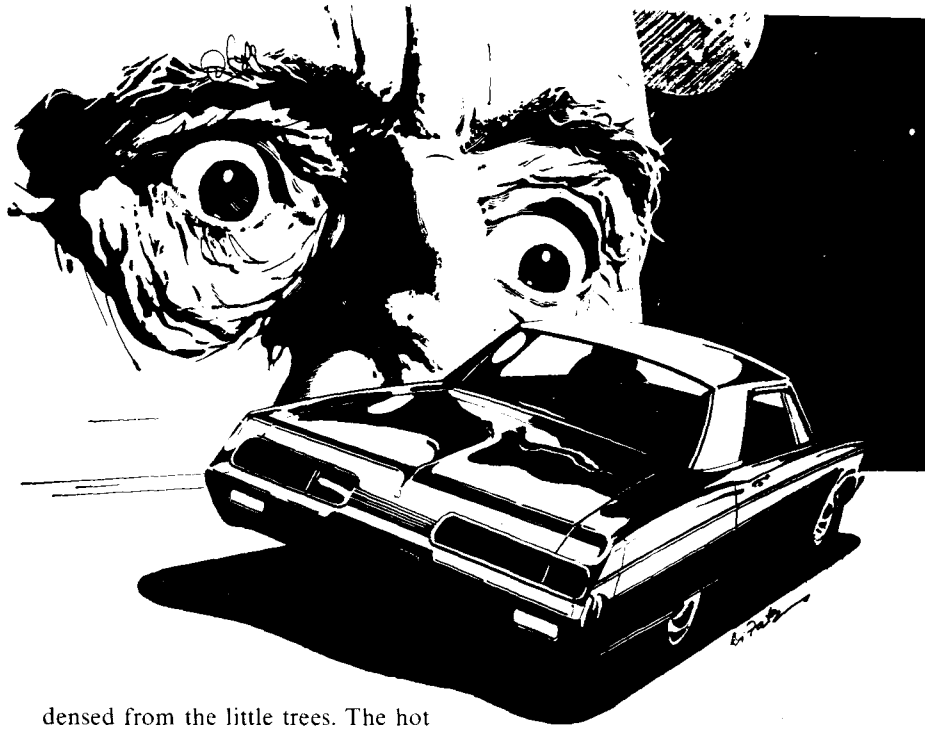

densed from the little trees. The hot engine ticked.

"They sure got hostile quick," observed Ravenshaw.

"Witches are conventional," said Nell. "It's like any religion. If you steal a ruby from an idol's head, or desecrate an altar, the believers don't like it much—especially a proscribed religion."

"I was kind of surprised to see you at that unholy gathering."

"Well, Arleigh, it's funny the people you meet." Her honey voice was dry. She was a dim figure in the dark, but Ravenshaw felt her shiver. He reached into the back seat and handed over his car coat. He said that fog muffles noise but you never could tell and she struggled into it without opening the door. She said, "General Craddock asked me to make a survey of the departments of psychology. Most professors put parapsychology into the same box with flying saucers. The American Association likes experiments to repeat. They never did like poor Rhine. He's popular as a steam engine man in Detroit. And at the same time"—her voice turned light and lovely with amusement—"they establish patterns in their own lives with wonderful irrationality—black cats—spilled salt—moon over the shoulder and all that."

Ravenshaw punched in the lighter

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and read his watch by the rosy glow. "It's just midnight. Will they be black massing?"

"Tell me which way a cat will jump, Arleigh?" Her voice was soft. Their body heat had warmed the car. Ravenshaw ran down the window and listened. No noise outside, though he could hear the blood surging through his arteries like 1910 plumbing on the outside of a house.

"Let's peel out," he said huskily.

"All right, Arleigh."

He started the car. Her voice didn't curl around his ear, it threw a half-hitch around his stomach. The trouble with this woman was—the thing that grabbed him like a goldfish in a washing machine—his room at the motel was warm and the lights were dim—he was God's own idiot—pay attention to the road. The trouble with Nell Rowley was—

The trouble was he had no idea of direction. The little track scrambled on interminably. They came to a dead end where the road petered out in a forest. Ravenshaw backtracked without much hope. He had a vague idea that the piney woods ran into Arkansas and Texas. Twice they ran out of the fog, twice he sighted the north star, twice it was in the wrong place. The heater purred. Nell was silent at his side. She was not asleep. He did not want to hear her high honey voice. He was a low-voice man.

"What do you mean, loathly disease?"

"Of the mind," she said. "Hallucinatory omnipotence is horridly dangerous to the infected person. They get destructive when someone thwarts their attempt to feel alive. Sometimes they think they can fly, and sometimes they try it from a twelve-story window. If society is walking along below—well, it's too bad."

The road turned up to an old railroad bed and they plodded along through the fog. "Damn foolishness," Ravenshaw muttered, and resolved to stop and wait for dawn at the next reasonably secure spot. He could walk around and get his feet wet and cold. Nell could sleep in the car.

From the left was a burst of light. A car surged onto the roadbed behind them. Ravenshaw slapped the rearview mirror askew and the gas pedal to the floor. "Two cars following," said Nell. Ravenshaw was overdriving his vision four times and the leading pursuer was on his tail. The roadbed was straight. He needn't have bothered with the mirror. It exploded and spewed glass. An unlikely shot.

In a flickering instant, Ravenshaw wrenched the wheel to follow the downturn. The car hurtled down the slope and for the first time in his life, he rode a two-wheeled car before the Chevvy slammed to the ground and fishtailed.

To the right and above, a set of headlights cut an arc through the night. Ravenshaw was more or less

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in control when there was a grinding crash to the side and a wheel appeared miraculously in the air ahead of him, floating through the fog. It smashed the road and vanished. It vanished as the trestle had vanished that once had spanned the wash. There was an orange-red glow behind as they swept up the other side, still at a ridiculous speed.

"The other's following," said Nell. "Hallucinatory omnipotence. Maybe they can fly?"

Ravenshaw growled. "Extra-chance causation was all that saved us last time."

"Hold onto that thought." Could honey be dehydrated to as dry a voice as she used? "They're gaining. Did I tell you, Arleigh, that my forgotten years are coming back in patches of memory? Of course not—time is always muddled with us. Dr. Grenville at Houston is the foremost authority on the hypnogogic state—memory, you know, lies on the shore of sleep . . ."

"Fog's clearing." The headlights picked up a great sweep of roadbed curving ahead. He smoothly increased speed until they were marginal on the surface at seventy-five. The pursuit dropped back and then closed the gap at an irrational pace.

"Fog's clearing," she repeated as they hurtled into the mist again and drove blind. The headlights behind grew enormous. When they burst out of the fog it was too late.

The pursuit stumbled and rolled as the driver turned off the roadbed. The car tumbled sideways until it hit a stump and bounded off the ground. It finished up very much like a giant wad of crumpled tinfoil.

Another long gone trestle.

In the split second left to him, Ravenshaw let up on the gas and pulled the wheel back as if to lift the car in flight. Nell's face was stark with concentration.

And off they went—

—Instantaneously to the wildest jolting of the night. It got worse as they slowed. Railroad tracks stretched ahead, burnished bright with use. There was no fog. Ravenshaw fought the juddering wheel. Safely over the running stream, jolted more severely by the ties, the hurtling car knocked a tin signal flag sideways and they bounced onto a spur. Leaves and dirt had filled the space between the rails and Ravenshaw hauled the Chevvy off the tracks onto a faint road, well before they smashed into a boxcar.

Now that the car had stopped shuddering, Ravenshaw began. He pried his fingers loose from the wheel. A big muscle in his thigh was twitching uncontrollably and his left arm was throbbing below the shoulder where he had banged it in their flight. He breathed deeply. "Pretty good trick." He rubbed his arm. "I wonder where we are?"

"Natchitoches & San Augustine Short Line," said Nell, reading the label on the boxcar. It had been converted to living quarters. A dim yel-

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low light appeared in the window.

A door opened and a man in a long nightshirt bellowed, "Who's there?" He had a lantern in one hand and a sword in the other.

"Funny, but not comical," said Ravenshaw. "Hey, which way is Natchitoches?"

The man in the nightshirt lunged toward them with the sword raised high. Ravenshaw jammed the lever to drive and the Chevvy jumped. There was a smashing noise and then they were running easily on what appeared to be a wagon track. A howl of outrage faded in the distance. Ravenshaw was wondering how a man could move so fast with a nightshirt down to his ankles when Nell said:

"The worlds exist in the mind alone—

Who knows this truth can dance with fire

Or fly through air or float on stone.

"My memory is returning in little isolates." She spoke in a brooding voice. "I remember that nursery song. I remember a doll named Elinor. I was singing it to her under a chinaberry tree, and I remember thinking about worlds as thick as chinaberries, all in the heavy shade with the summer sun blazing outside."

Ravenshaw stopped the car after a couple of miles and got out to see what had caused the smashing noise. A cavalry saber with a basket hilt was wedged into the crumpled top of the fender just ahead of the taillight. He wrenched it free. He put it into the backseat and got the .32 from its hiding place in the tape recorder. He stuck it in his coat pocket. All bets were off when hostile natives attacked without provocation.

Nell said, "I think education in the world I came from was implemented with psychological slow-release built-ins. Sometimes not so slow, instant instinct, latent until triggered by need. It's an odd feeling. If you asked me if I played the zither, in honesty I would have to reply, I don't know. I never tried."

"Can you do it again?"

"Jump worlds?" she said. "For me right now, it's an idiot savant ability. I can't add a long column of figures in my head, but if you want to change worlds, I think I know how."

"I killed a vesper sparrow with my new BB gun," said Ravenshaw carefully, "and I was too old to think I could put it back together again. I knew about Humpty-Dumpty and irreversible actions. Ever since, I've been careful. How about it? Can you examine this thing, or will you kill it if you stick your fingers into the mystery?"

"It's more like perfect pitch," she mused. "You don't learn it. It's there."

"Is it hard to do?"

"If you can break a soap bubble by thinking at it, you can step between worlds—I think."

"I wonder we didn't bump into something. I suppose that's got to be

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part of any practical way of jumping—" He stopped talking to listen. There was a rhythmical clanking noise growing louder from the rear. A monster, thought Ravenshaw, a heat-seeking robot with steel teeth—a Patton tank with infra-red eyes—a mechanical boa-constrictor one hundred twenty feet long—a telescope-legged Martian!

The wagon track was masked from the railroad by a clump of trees. The horror was real, limned against the sky, elbowed like a spider. All the dangers of the night overwhelmed Ravenshaw.

"He's pumping his way down the track on a handcar," said Nell.

If somebody stuck him with a pin, thought Ravenshaw, adrenalin would squirt twenty feet. He was not actively ashamed of being frightened because he was not actively proud of the two silver stars he wore on his dress uniform. He won the first years before when he got lost on a patrol and stumbled into a North Korean machine gun emplacement. He wiped it out to save his own life and took the prisoners because they knew the way back to his lines. He would not be pusillanimous, but neither would he claim blind courage. He felt a sneaking sympathy for Richard Hannay, who described himself as a cunning coward.

The noise of the handcar faded away. Ravenshaw complained, "I've been tossing from side to side tonight looking for a comfortable spot like a fakir on a bed of spikes. I hate to be involved with these damn awful derring-do situations. My grandfather used to tie a knot in each corner of a handkerchief and put it over his face and go to sleep on a sunny Sunday afternoon. I think I have finally got a goal in life—that's what I want to do." He knew he was babbling, but it took a while to stop. He felt like a mechanical toy dog that took two steps, went *yap-yap* and took two more steps. *Yap-yap.* "In the meantime, while I'm looking for a handkerchief, do you have any constructive ideas?"

"Are you complaining because you're with me?" asked Nell in her honey-and-vinegar voice.

"I was only—"

"It is my fault for dragging you out of that clutch of moral defectives? You wanted to consummate the initiation with that lop-faced witch?"

Ravenshaw flung the door open in exasperation. More than halfway through its brutal arc there was a hollow thunk. The door bounced back at him. There was a scrabbling, groveling noise and a hiccuping groan. The man on the ground was in his nightshirt, illuminated by the courtesy light of the door.

"Ill-met by starlight," said Ravenshaw. The man tried to sit up and banged his head on the edge of the door. Ravenshaw reached back for the sword and poked it in his stomach to get his attention. "Now what the hell is this all about?" He sat

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with his heels hooked on the doorsill, the sword between his knees. Nell leaned against his back and snorted in his ear. She was laughing.

"Kill me," said the man on the ground. "Egalitarians never will be slaves!" He raised his head, hit it again and subsided.

"A bloody damn farce," said Ravenshaw.

"Polluting interworld fiends!"

Ravenshaw was embarrassed. The fellow had a look of backwoods probity about him. He had wit and courage, to let the handcar go while he jumped off to investigate the aliens. Ravenshaw asked, "Where are we?"

"Go to perdition," groaned the man.

"What year is it?"

"I'll never tell."

Ravenshaw slammed the door, started the engine and drove off. He put on the brakes and stuck his head out the window. The man in the nightshirt was on his feet, weaving in the red glow of the taillights. "Your bravery and fidelity have convinced me that . . . uh . . . egalitarians never will be slaves."

"What was that about?" asked Nell.

"I put myself in his place. Up against rampant immorality. What could he tell us if he spilled his guts? I saw two things. First, he could run because his nightshirt was slit up to his knees. Second, we're lost. We're on a shim world, all right. We're on a chinaberry world. Nell, we're on one of the infinite worlds—"

"Yes," she said, "I thought of that. How do we get back?"

They were parked on a low bluff two hundred yards away from the Red River. Ravenshaw walked around the car. It had been clean when he bought it, but now there were pockmarks in the trunk from the shotgun blasts, a hole in the rear window from the rifle shot, the rearview mirror was smashed, the hood was creased, the right quarter panel was scarred from the switch plate, the fender from the sword, and there was a big dimple in the left door from the man's head. If he had a plumber's friend, he could pull that out.

"What's so funny, Colonel Ravenshaw?" Her voice was acid.

"I was wishing for a plumber's friend."

"On the end of your nose?" she asked sweetly.

Ravenshaw dismissed the temptation to quarrel with her. "What have I got to complain about?" he said. "It's a nice day. You're purty as a blue-tick pup with a yella ribbon." He grinned at her.

After leaving the dedicated young man in the nightshirt they had covered a few miles on the wagontrack toward sunrise, when they were ambushed by four men with pitchforks. Nell switched worlds. This was a horror. They were engulfed by garbage-pit smog. They were choking, the car and the people in it, when they reached an extensive dome. It

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was so corroded they could not see in. The Chevvy was bucking and choking. "Let's get out of this!" said Ravenshaw, and they were once again in the country at dawn. They opened the windows and curdled yellow-brown smoke poured out. They were again near a railroad. Ravenshaw hyperventilated his lungs and listened to the long wail of a steam whistle as an engine came into sight. The locomotive was a freshly shopped 2-8-2 Mikado, No. 324 of the Natchitoches-Nacogdoches & Western RR. The engineer saw them and hit the brakes. They had to be air brakes to stream sparks from every truck. The fireman jumped off and started toward them with his shovel and the cars erupted passengers. Nell broke the soap bubble and they were sinking in an endless waterglazed world before they found themselves in a jungle with noises like the Tarzan movies. And again, to a city street with mound houses, inhabited by fishbelly faced white men, web-fingered and weedy. And again to the countryside, this world in a prolonged drouth. They drove over dead grass until a cluster of buzzards rose from the bones of a wagon with skeleton horses still in place. And again and again, until they came to a crumbling brick roadway running by ruined houses to a bridge that crossed the Red River with the second span broken into the water.

"Here we stop," said Ravenshaw, and he got out to look over the car. "I don't know if we're lost in space, or time, or both, or neither. I know we'd both be dead if you couldn't switch worlds. The reason I stopped here is because this seems to be a likely place to build a bridge. If you can flip us through worlds for a while, we can watch the traffic and get a close approximation."

Her mouth drooped. "I'm afraid it's random."

"Chin up. We know it can be controlled. The Drishna can do it and the Mier seem to be ubiquitous. It's not blind. I'm hoping it's phototrophic and our heads will turn to the sun—to our own world." Ravenshaw wondered who he was reassuring, but it didn't matter. He had been a professional backboard for years with the troops batting on one side and the higher brass on the other. Somebody has to be responsible, he told himself.

"We're looking for a grain of wheat in Kansas—an individual grain," she said in a low voice.

"If it's only Kansas, we've got a good chance," said Ravenshaw stoutly. "Let's get into the car. When we were sinking into that forever mud puddle I was just as pleased I wasn't standing alongside."

For the next hour they skimmed through worlds. If there was a bridge of familiar construction—this happened four times—they paused for further information. Twice there were horses and wagons, once there was an automobile of vaguely 1910

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vintage with footmen standing on a rear running board, and once the vehicles were silver beetles, more like Stout's Scarab than Volkswagens. Most often there was no bridge at all. One time there was a dead-level span no more than a foot thick and Ravenshaw pressed Nell's hand with the utmost reluctance. Who could have made such a thing and of what materials?

It developed that the quickest way to view the worlds was for Ravenshaw to make the decisions while Nell concentrated on slipping through them like a hot knife through butter pats. She was getting glassy-eyed when he said, "Hold it. We'll stay here a while."

There was no bridge and the world was a pristine Eden. Ravenshaw opened the door and walked quietly to a tree. He managed to pluck four pigeons from a branch before the others took flight. He built a fire and cleaned the birds. He made no objection when Nell went to the river to drink and wash. He had thought about infinite types of bacteria but dismissed such peril as beyond helping. It was like the freeways of home where you drove at seventy-five, ten feet away from a horrible death and sometimes closer. When the fire burned to coals, he spitted the birds and cooked them. "I think they're passenger pigeons," he said. She said they were delicious and could he get more? He said why not and bent over to clean his knife.

There was a faint hissing of a disturbed air, a twang and a crash. An arrow stuck out of the rear fender. Ravenshaw had Nell on her feet and into the car in a swooping instant. "Vamanos!" he said.

In the next world the river was brown and a misty rain was falling. Nell had held onto her pigeon and while she finished eating, Ravenshaw pulled the arrow out of the thin sheet metal. The chert point had shattered and he threw it into the back seat after a cursory inspection. Nell licked her fingers after she dropped the bones out the window.

"I'm right along with Cyrano," she said. "He filled bottles with dew and held them under his arms because dew is attracted to the sun. I think that's how he flew, but I'm not sure. Arleigh, I think you can help—not collecting dew—but while an idiot savant is unapproachable as Queen Victoria, I have a ghost of a feeling that we'll be more selective if you come along." She smiled at his puzzled expression. "You can design a bridge, can't you?"

"Cantilever, arch, suspension?" Ravenshaw was doubtful.

"Whatever is likely in our world, in our own time and place, in Louisiana in the United States."

"I think about a bridge?"

"It might be a nudge in the direction we want."

They sat in the car and tried again. Nell had purple thumbprints under her eyes. Ravenshaw was doggedly persistent. It was hard to concentrate on bridge construction, but after a

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weary while, he decided that when he formulated bridges in his mind, there were more bridges in reality.

"Stop," he said. He watched an elderly Pontiac with a chromium strip in the middle of the hood drive toward them over a concrete piered, reinforced arch bridge. One of the good-looking slab-side Lincolns went the other way. A dusty Plymouth wagon followed the Pontiac and there were two Fords, a Buick and a muscle car he could not identify, since they all looked alike to him. "I think we're very hot," he said. "Let's drive over and get a look at Natchitoches."

He did not realize how taut he had become until they followed the dirt road to the highway and drove into town. The garage he had used was still there with the wonderfully familiar battered jeep. Nell said, "Stop at that store. Do you have money?" He handed her a twenty dollar bill and waited at the curb, reading a Dr. Pepper advertisement in the window with the greatest pleasure. The people looked wonderful to him after that brief glance at the white men.

Nell returned in new blue jeans, a shirt and tennis shoes cut from Joseph's coat. She had a peculiar smile on her face. She sat beside him and closed her eyes. No wonder. They had been up all night and the clock in the bank said 11:30. He would pick up his bag at the Tauzin Motel and they could drive to another town to sack out. He started the engine.

"Wait a minute," said Nell. She handed him a two-fifty dollar bill.

If Ravenshaw had been asked for an appreciation of the tactical setup that afternoon, he would have answered in the words of Loose Wire Pedersen, "Duh, I dunno." The Topkick said, "Didja ever see a sparkplug tester, Colonel? They screw up the juice until sparks crawl down the side like hot spiders. Our boy's got his insulation cracked. His mind don't track."

Ravenshaw and Nell drove to Many, thirty miles away, where they stopped to find out why the Chevvy was pulling to the right. It had a bent tie rod. While it was being straightened and the front end aligned, they had a meal and walked around town. Ravenshaw paid a nickel for a map at the garage. There was no Fort Worth and Baja, California was colored United States. Nell bought a copy of the *Picayune*—not the *Times-Picayune*—and Ravenshaw listened to her comments with apparent intelligence. When the garageman asked how come this was called a Chevrolet when it was a Durant, Ravenshaw said it was an experimental car on a drive-it-to-death test. They went on to Rosevine, Texas and called it a day.

Ravenshaw could not sleep. He had too many jigsaw pieces scrambled in his head. It was great to jump out of the frying pan into another hot frying pan. It was dandy to run and run and run. You can't catch

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me, I'm the gingerbread man. He felt like a grasshopper, when every jump is from one microecology to another. What about a gingerbread grasshopper? What about another hot shower?

He woke in the morning with his mind at some sort of uneasy equilibrium. The trouble with infinity was that there was no way to pick the same number twice. Set an enormous computer to work, or a dozen computers, and the odds—by definition—were infinitely against finding home. Transfinite mathematics suggested only another term for the shim worlds: the aleph worlds. If there are an infinite number of points on a plane, a line connecting any two is possible and there are an infinite number of lines. It takes three points to establish a curve and you have an infinite number of curves. He looked at this picture and decided he was tangled in an infinite spiderweb.

Nell listened, but was not impressed at breakfast. "The Nineteenth Century bumblebee could not fly mathematically. A hummingbird would have to carry a sack lunch to make it on his migrations."

"Not enough information, or to hell with reason?" Ravenshaw was annoyed. "Or are you trying to say things are not as bad as they seem?"

"They're a great deal worse. We have no responsibility or accountability. We can pick a bouquet in a public park, or eat a meal and not pay for it, or steal gold to build a dragon's nest." She looked at him sideways. "We have the divine right of kings without practical considerations of kings. We can always run away. This is a horridly dangerous thing."

Ravenshaw groaned. "If you're rigging a moral balance, aren't we immoral every time we jump?"

"Does expediency balance irresponsibility?"

"I don't know what you're talking about," said Ravenshaw, "but you'd better get ready to be irresponsible. Here comes a sheriff."

He was a sincere young man with the steely look in his eyes that is issued with the badge. Purely as a matter of routine, he said, he wanted them to follow him to the substation where they could explain to the sergeant how the bullethole got in their car. Also the shotgun pellets. Mr. Caddis's driving license would be returned at the station. If they were quite ready?

Ravenshaw paid for breakfast with a two-fifty dollar bill; the young man spoke with the cashier and wrote her a ticket for the money. Once in the car, Ravenshaw said he had wondered about the twenty dollar bills. Andy Jackson was not smiling on the ones they had used in Natchitoches, in Many or the one he had used to pay for their rooms before breakfast. When a second sheriff's car swung in behind them as they followed the first, Ravenshaw said the other worlds looked better

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and Nell agreed. He pulled to the side of the road and stopped.

It was just as well he had. They were in a small glade, surrounded by trees. "Think highways," said Nell, and Ravenshaw pressed her hand. They were in the middle of a swamp, then immediately on a cinder world with not one living thing on the burned glassy surface, and back to the woods again.

Ravenshaw was tired of the wonders of the worlds. He controlled his exasperation. "We're scattershot today. Try again."

Water poured into the car.

Then they were in the middle of a forlorn town, sitting in water up to the windowsills. Ravenshaw opened his door, coughing, hacking, totally soaked. A thin rain was falling. The day was cold. Nell looked like a drowned rat. They were on a muddy main street, but there was no movement except for a black cat that bounded to the shelter of a porch and glared at them indignantly. There was a sign in the window:

Hearts Desire and
Other Simple Wants
Magic Neatly Done

Ravenshaw snorted. "Crazy in every world! We're delivered into the hands of temptation, all right. We can jump from world to world robbing banks, living it up in the best hotels, not a single obligation!" He had been in the middle of a breath when the car was suddenly thirty feet under water. Nell had evidently been exhaling because she wiped water from her eyes and laughed at him.

He shuddered in the cold. He was furious. The water in the floor well was still three inches deep. He took both her hands and looked into her violet eyes and said intensely, "Dry country. Desert!"

They both got out of the car into the hot sun. Ravenshaw sneezed and coughed and spit again. He opened the hood to let the engine dry. It was scruffy country with low brush, and blow sand had blotted parts of the road. There were a couple of buzzards in the sky. He wondered if this world had a different axial tilt to account for a desert in east Texas and found he didn't give a damn. Maybe the polar ice had melted in the water world. Who cared? He was wet and enraged. The frustrations of the past days overwhelmed him.

"Look," said Nell softly. On the second hill away was a tower, not of rubies but vermilion, rich and promising with fruit trees at the base. Ravenshaw gave it one glance.

"Look, we can leap through worlds like mad tuna until we turn blue, but the footloose are never fancy-free. You've got to have a fixed mark, maybe worth unknown, height taken. How does your nursery rhyme go?"

"The worlds exist in the mind alone—

Who knows this truth can dance with fire

Or fly through air or float on stone?"

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"That's the basepoint," said Ravenshaw. "And then it's hearts desire." He was deep in thought and she studied his face. "Maybe there's a drain plug. We don't want to drive around in a swamp. What are you grinning at? Maybe we could bail out the floor well—hell with it. Climb in."

"The seats are wet—"

"Hubba-hubba. Get in," said Colonel Ravenshaw.

She got into the car.

"The gross facts are ridiculous," he said. "The commonality is interior in us. Believe, dammit! All the crazy things like luck and witchcraft are dribbles and splashes and puddles from this bottomless lake." He was speaking faster and faster. "A fellow named Edgar Wallace wrote about a diamond that fell out of the sky and shattered. A thousand men grabbed a fragment and yelled look at me I got the whole single unique truth in my hand—"

"Arleigh?"

"Hearts desire!" He grabbed her and held her tight. "Home!"

General Craddock met him in a scuzzy bar in Beaumont, Texas. He said it was all very unsatisfactory and a civil war sword and a broken arrow were damn poor souvenirs. Not only that, how did Ravenshaw know he was home this time?

"It's a feeling. I know it's right. All points correspond. For example, how's the tiger hunt?"

"It was a military affairs senator with some skeletons in his closet," said the general, grudgingly. He brightened. "Now he phones me for an O.K. when he wants to blow his nose. I had some words with his associates. When they itch, they check before they scratch. Where's Nell?"

"Over in Houston with hypnogogic Dr. Grenville."

"I know all about him. Why isn't she here with you?"

"She got a little upset." The general stuck an earpiece of his glasses in his ear and scratched. Ravenshaw went on, "When I knew we were home, sitting in that cornpatch near Rosevine, I kissed her on the cheek. She said she could kill me. I quoted a Mexican song that goes, don't kill me with a pistol or a knife, kill me with your lips of coral. That was when she belted me."

"She did the right thing," said Craddock.

Ravenshaw said soberly, "Nobody travels the infinite worlds for fun. I think the Mier have obligations. The other thing is that sooner or later she'll remember my wife's not dead on one of the aleph worlds."

"You are an idiot," said Craddock.

"What shall I do now?"

"You've killed the paranormal investigation with your lips of coral. Anyway, I got you a ticket on Baniff out of Houston for Lima, Peru. Go down and look at some frozen fish."

"Roger-dodger you old . . . I mean, yessir," said Ravenshaw, happy to be home in the comfortable routine of his own world. ■

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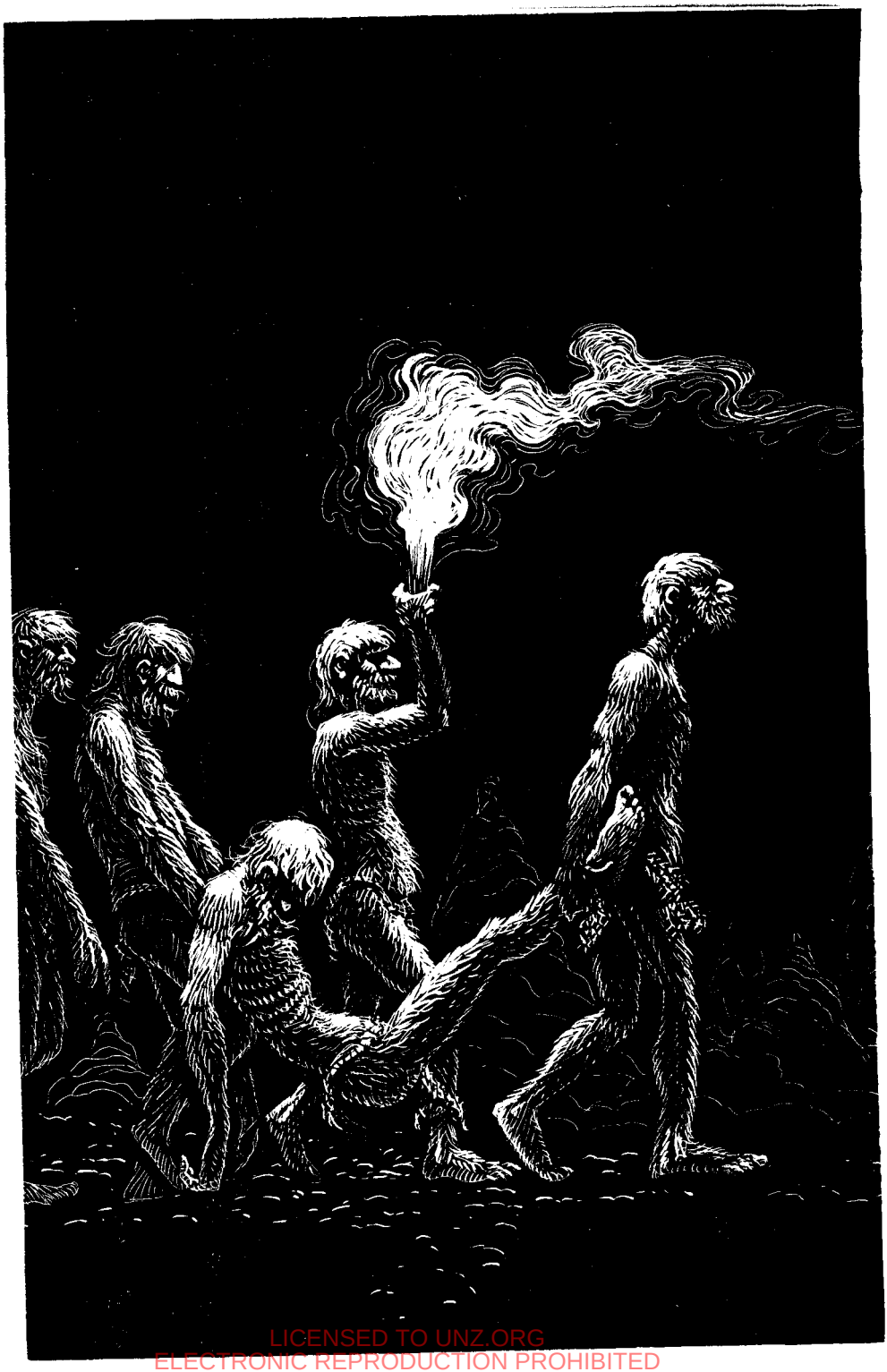

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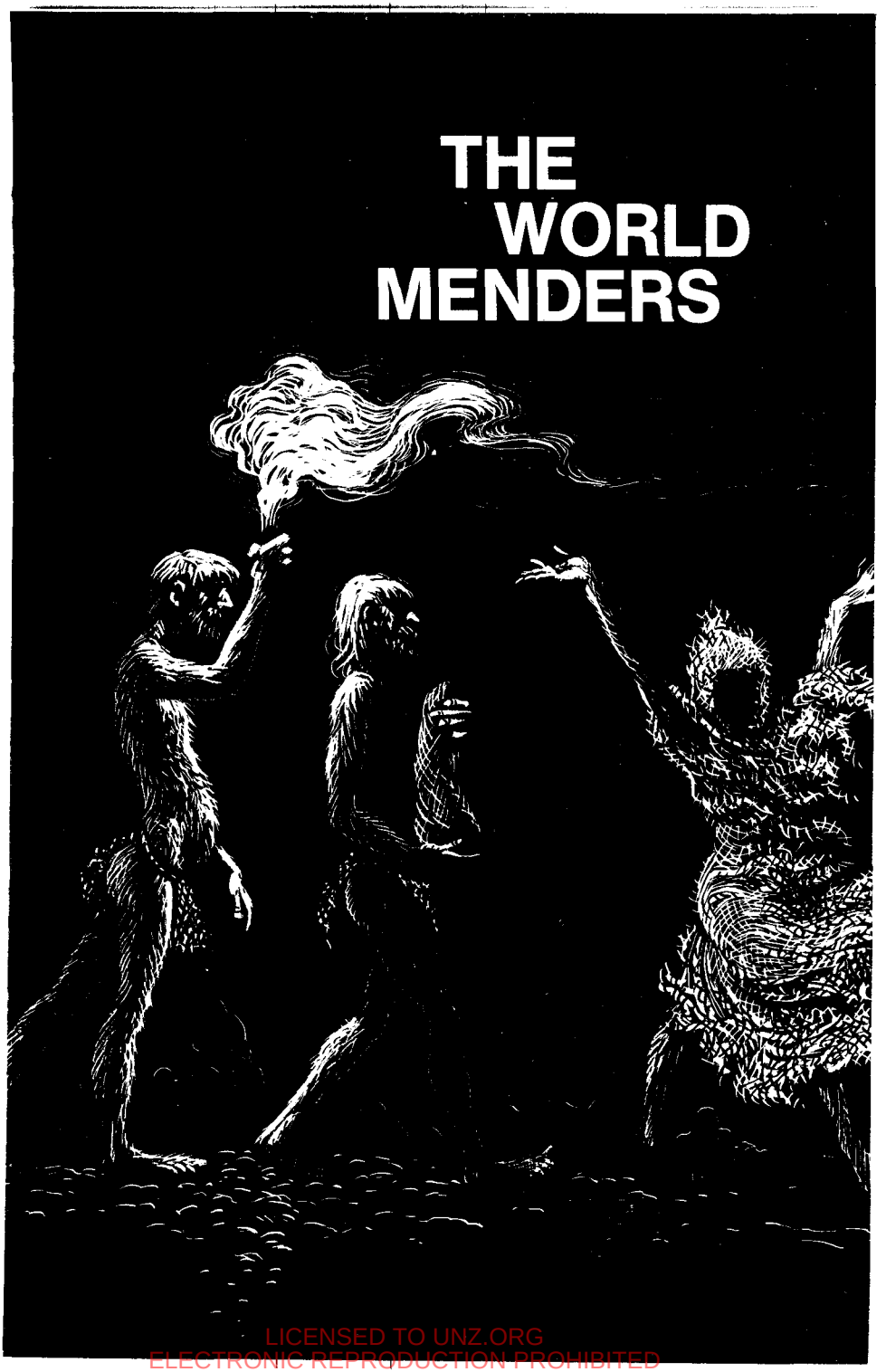
THE WORLD MENDERS



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Last of Three Parts.

One of the problems that has never been adequately considered is "When is a slave not a slave, so freeing him is impossible." That unconsidered problem presents aspects that make it inherently insoluble

LLOYD BIGGLE, JR.

ILLUSTRATED BY KELLY FREAS

SYNOPSIS

The Interplanetary Relations Bureau had as its most important function the qualification of nonmembers for membership in the Federation of Independent Worlds. Applying its motto: DEMOCRACY IMPOSED FROM WITHOUT IS THE SEVEREST FORM OF TYRANNY, with fanatical diligence, the Bureau attempted to improve the nonmembers' technology and to reduce their political establishments to the minimal level democracies required for Federation membership. The most critical obstacle was that this had to be achieved by the native peoples themselves without apparent outside intervention. The Bureau functioned on nonmember worlds without those worlds being aware of its presence.

Some problem worlds tenaciously defied the Bureau's efforts. When one such world was brilliantly brought into line by an officer of the Cultural Survey, the Bureau immediately requested CS men for service at all levels of Bureau organization. Because there weren't enough available, the advanced trainees of the Cultural Survey Academy were, to their consternation, transferred to the Interplanetary Relations Bureau.

One of them was AT/1 Cedd Farrari, who was assigned to an IPR classification team on Branoff IV—a world whose only civilized political entity was the land of Scorvif, with a master race, the rascz, *a race of slaves, the* olz, *and the whole controlled by a god-emperor or* kru, *with a small class of intermarrying nobility, a potent priesthood, and a powerful military hierarchy with an excellent army. The Bureau confidently predicted that it would be two thousand years, at least, before the* olz *could take their first tentative step toward democracy.*

Farrari understood little of the IPR mission, and at first he was delighted with the high level of culture he found on Branoff IV. He studied the arts and crafts, pondered the rudimentary

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literature, and listened to the music, and he quickly discovered close relationships between his work and that of other specialists. The Cultural Survey view of culture, as a common denominator in all areas of study, enabled him to make valued contributions to many projects. He also made friends and became casually acquainted with clairvoyant Liano Kurne, a strange young girl who had lost her sanity as a result of an accident that took the life of her husband.

Farrari enjoyed himself and kept furiously occupied, but as time passed uneventfully he became concerned that he was somehow failing to fulfill his assignment: the study of IPR problems from the Cultural Survey point of view. After a talk with the world coordinator, Ingar Paul, it occurred to him that in concentrating on culture he had overlooked the people for whom that culture was intended. From the records section he borrowed a box of teloid cubes—time images of the olz. *The first projection made him the horrified spectator of the fatal beating of an* ol *woman by a* durrl, *or overseer. She had stolen a mouthful of food, and as punishment the* durrl *lashed at her with a* zrilm *branch, a shrub whose barbed leaves tore the flesh and also seared it with a caustic secretion. Other natives watched the beating with apparent indifference, but the expression in their eyes defied Farrari's comprehension. One such experience was enough, and he meekly returned the box of teloid cubes.*

Then he learned by accident that Liano Kurne had suffered a similar beating.

When a new teloid cube arrived of a tapestry that had been hung over the facade of the kru's *Life Temple, Farrari deduced from the scenes portrayed on it that the old* kru *was dead. This made him momentarily a hero, because it gave IPR a head start in its critically important study of the succession of power. Peter Jorrul, the field team commander, was so impressed that he took the Cultural Survey trainee to Scorv, the capital city, to find out what else he could do.*

Farrari reached Scorv disguised as a baker's apprentice, and he was immediately astonished to learn that the rascz *were not monsters, but a decent, serious people with a high regard for work, family and an orderly society. He was also surprised to find that few* rascz *had ever seen an* ol; *the slaves were a monopoly of the* kru.

All of the bakery personnel were IPR agents, and between Bureau assignments they had to produce a normal quota of baked goods. Farrari spent most of a night beating scum in huge vats that was used as a leavening agent in bread. So many agents had special assignments to study the coronation of the kru's *successor that the bakery was shorthanded, so when orders were received to bake a ceremonial cake for the* kru *and present it at the palace, Farrari was hastily trained to take part. His function was to walk at the heels of the journeyman baker, Gayne Prolynn, carrying the cake: a bread-shaped pastry wrapped in a*

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white cloth ornamented with the black crests of the kru.

Farrari had a brief but fascinating glimpse of the city of Scorv and its people, and he was able to see first hand the contrasting styles of architecture he had studied: ponderous, ancient buildings interspersed with gracefully decadent later structures. The most interesting of all was the ancient Tower-of-a-Thousand-Eyes, which rose above the kru's *Life Temple and was the eternal resting place of the rulers of Scorvif—each interred behind the eye of his choice through which he could forever keep watch over his people.*

Trumpets sounded abruptly, the populace erupted into the streets, and Gayne and Farrari were caught in the ceremonies of the coronation. They became separated, but Farrari felt completely safe in the enormous crowd. The ceremonies concluded when the portrait of the new kru *was unveiled for his worshipful subjects.*

Before the crowd could disperse, a group of priests came from the temple and began to push their way through it. There was no reason why they should pay special attention to a baker's apprentice, but they immediately surrounded Farrari and led him toward the temple—and to an inquisition in a language that he understood only slightly and did not dare try to speak.

He felt very much alone.

They swept through a huge hall filled with the massed nobility and priesthood of Scorvif. Farrari, acting the role of a shy baker's apprentice, suddenly understood that the cake was to blame for his plight. The priests had seen the kru's *crests on the wrapping. He climbed a ramp, executed the difficult bow Gayne had taught him, and laid the cake at the feet of the* kru. *The gift produced a sensation. Farrari had inadvertently been caught up in two* Rasczian *traditions: a gift for the new* kru, *and a loaf of bread for a divination ceremony. Because the cake looked like bread Farrari was privileged to wield the sword of prophecy; because it was cake he sliced it completely in half, thus guaranteeing the fat* kru *unending glorious achievement and eternal life. As a reward the* kru *made Farrari a priest, and at the first opportunity after nightfall Farrari escaped through a window and returned to the bakery, and the IPR agents hurried him out of Scorv.*

Only then did he learn that he had cost IPR the opportunity of a millennium. He had not been made an ordinary priest, but the kru's *personal priest, a post of enormous power and influence—and he could not have taken advantage of the opportunity in any case because he hadn't bothered to learn the* Rasczian *language.*

Returned to base, Farrari found that he had lost interest in culture. He could not understand why until it occurred to him that the olz *were the main IPR problem on Branoff IV, and the perennially starving* olz *had no culture—no art, no music, no literature—no wonder he had been unable*

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to study their problem from the Cultural Survey point of view! He invented a new IPR slogan—ONLY AN EXCEPTIONALLY TALENTED PEOPLE CAN CULTIVATE A SENSE OF BEAUTY ON EMPTY STOMACHS—and he asked the coordinator to make him an agent. The coordinator flatly refused until Liano Kurne suggested that she accompany Farrari. Then the coordinator asked him to undergo agent training as a special favor—to help Liano regain her sanity.

The training would have been difficult enough without Liano's unpredictable, often bewildering changes of mood. He was days learning to walk like an ol, *and the* ol *language confounded him. At first it seemed unbelievably primitive, and then, as he learned more, fantastically complex and sophisticated.*

The coordinator's reluctance to expose a CS man to danger was overcome by his eagerness to help Liano. He permitted them to take the field in a safe area at the safest and most pleasant time of year—the autumn, when the harvest was in and the olz *temporarily had enough to eat. They were* yilesc *and* kewl, *peregrinating medicine woman, or sorceress, and her* ol *slave, two roles ideal for a pair of IPR agents. The* olz *fascinated Farrari—they were without culture, without joy, without laughter, without even an illusive, inward turning smile. They existed and seemed unconcerned as to why. Liano fascinated him more. He ministered to her needs around the nightfires, a lowly outcast even among* olz *as he humbly did her bidding while she pronounced her incantations and performed rites of health.*

When winter came on they were returned to base for further training. Farrari had done well, he had learned to act like an ol. *Now he had to learn to think like one. Peter Jorrul, the field team commander, cautioned him that things would not be so easy when he returned. This was the year of the half crop, the year when half the arable land lay fallow, and the spring of starvation would follow.*

They returned in an unseasonably cold spring and found the pale, starved olz *so weak that four of them struggled to lift a log onto the fire. They lacked the strength to remove their dead, and living and dead lay together in the huts. Farrari and Liano moved from village to village and did the little that they could do. Then they found a village where the* olz *were dying of a strange virus. Base responded with a specially compounded antitoxin, and while Farrari and Liano were caring for the sick a* durrl *happened by, became enraged at the enormous pile of dead* olz, *and attacked Liano with his* zrilm *whip. Farrari saved her by attacking the* durrl, *but that finished his career as an agent. No* ol *would dare to attack a* durrl, *or even look at one, but Farrari could not think like an* ol. *When they returned to base he asked Liano to marry him. She refused, and a short time later she returned to the field with another* kewl.

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Jorrul came to tell Farrari that she had disappeared. Farrari said, "When you send an IPR clairvoyant to play the role of a yilesc, *who is a native clairvoyant, there's a grave danger that she might actually become one."*

He found life at base insufferable. He had to return to the field, or ask for a transfer. At the first opportunity he smuggled himself aboard a supply transport, and at the first stop he vanished into the night. His plan was to avoid the territory where Liano had disappeared—because that was where IPR would search for him—and to learn what he could about the olz. *After many days of traveling, during which he seemed to accomplish nothing at all, he encountered a strange, elderly* ol *whose hideously scarred face and body bespoke a horrible encounter with a* zrilm *whip. It was an IPR agent long since given up as dead. Calling himself Bran, he invited Farrari to his place—together, he said, they could solve the problem of the* olz. *He lived in one of many caves that riddled the mountains surrounding a lovely, concealed valley, and he had filled its shelf-lined walls with supplies stolen from IPR caches.*

Bran's theory was that the olz *wanted to die, and they could be saved only by making them want to live. Farrari explored the valley and discovered a cave with carvings of* olz *and an ancient view of Scorv showing an* ol *ruler on the Tower-of-a-Thousand-Eyes. This was breathtaking evidence of high* ol *culture and civilization, and Farrari felt inclined to agree with Bran—centuries of slavery had cost the* olz *their will to live. They planned an experiment aimed at restoring a sense of self-respect to the* olz*—they would ridicule a* durrl *in the presence of his slaves.*

They tricked a durrl *into an* ol *village, and then, disguised as* olz, *they mimicked and mocked him, played pranks on him, and restrained him when he tried to use his* zrilm *whip. When he mounted his* gril *to ride for help, Bran had tied the steed's legs together. It fell, and the* durrl *was killed.*

The olz *built a mound of rocks and dirt and demolished huts. They placed the* durrl's *body there and prostrated themselves before it. Bran and Farrari were thunderstruck—the* olz *were worshiping the master who starved and murdered them! Farrari said, "I knew it wouldn't be simple, but I never expected anything like this. How do you organize a revolt against the gods?"*

Part 3

XIV

As soon as Farrari awoke he crossed the valley for another look at the *ol* carvings, and the mute figures displayed there were as bafflingly uncommunicative as before. It seemed to Farrari that every discovery concerning the *olz* merely intensified their enigma. Evidently the *rascz* had followed the *olz* in making the Tower-of-a-Thousand-Eyes the center of their religion. Was it only

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the tower that they adopted? No amount of pondering enabled Farrari to comprehend a turn of events by which the conquerors took the religion of the conquered and the conquered made gods of the conquerors.

Bran was still in bed when Farrari returned—wide awake, but lying motionless, muffled in robes, a dark, brooding expression on his scarred face. He answered surlily when Farrari spoke to him. The *ol* actions that perplexed Farrari had crushed Bran.

Finally he bestirred himself and slouched down to the stream, where he scooped a handful of water and in the same motion tilted back his head and tossed the water into his mouth. Then he pivoted slowly and slouched back to the cave.

Farrari had never been able to drink *ol* fashion without splashing his face or losing most of the water. He had to drink in secret, because any *ol*, even a child, could perform that exacting operation with precision. Bran had not wasted a drop except what he absently shook from his hand afterward.

Bran was the complete *ol*. The things Farrari, by dint of intense concentration and effort, did half well and hoped that no one would notice, Bran did instinctively and perfectly. Years of playing the part to its minutest detail had made the role of *ol* more natural to him than his own identity. Bran was . . .

He was too perfect. Farrari had observed the *olz* far more intently than they ever observed each other, and he also had observed IPR agents acting as *olz*, and suddenly it seemed to him that there were differences. The experienced IPR agent aimed at anonymity, at portraying the average *ol*, because he could not risk the slightest irregularity that might call attention to himself. He acted as most *olz* would have acted in any given circumstance.

But there was no such thing as an average *ol*. All were individuals, all had idiosyncrasies. The *ol* who was average in everything stood out as distinctively as if he'd been radically eccentric. It seemed odd that the IPR Bureau had never perceived this, and odder that the *olz* had not detected the synthetically average *olz* that IPR sent among them. Or had they?

Bran seated himself on a slab of rock, ripped open a rations package, and began chomping on biscuits while directing a blank *ol* stare across the valley. Farrari sat down beside him.

"What is the *ol* religion?" he asked.

"You saw it," Bran growled. "They worship their *durrlz*."

"It can't be that simple. What's the background of myth, or superstition, that made them accept their conquerors as gods?"

Bran shook his head. "That stuff is for the specialists at base."

"What do the *yilescz* have to do with it?"

Bran shrugged and shook his head again.

In Farrari's training religion had

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not been mentioned. In all of his field experience he had encountered nothing that remotely suggested it, but it did not seem possible that an intelligent race could be so devoid of religious thought, traditions, practices or superstitions. "The question is," Farrari mused, "haven't the *olz* got any, or are they just extraordinarily successful in keeping it a secret?"

"If they had any, I would have found out about it," Bran growled. "You can't live with a people for years, *be* one of them for years, without knowing whether they have religion."

"Did you know that they worshiped their *durrlz*?"

"No . . ."

"The specialists at base don't know it, which means that no other agent knows it. What do the *olz* do with their dead?"

"Nothing special. They have a burial cave if they can find one. Otherwise I suppose they dig graves, or cremate them."

"Is there a ceremony?"

"I dunno. I helped carry a lot of dead to burial caves, but I never hung around to find out if there was a ceremony."

"Why not?" Farrari demanded.

"The other *olz* from my village didn't wait, so I didn't wait."

He lurched to his feet and slouched away, still munching biscuits. Farrari went back across the valley for another look at the carvings.

He could think of no explanation of the Tower-of-a-Thousand-Eyes except as a religious edifice. The ancient *olz* must have possessed a highly evolved religion, with a priesthood, dogma and elaborate public ceremonies. What had happened to it?

In the days that followed he repeatedly questioned Bran, but Bran did not know and refused to speculate. Farrari wanted to make plans, to try other experiments. Bran responded with a tirade against the *olz* and morosely slouched away, and Farrari, shaken by this unexpected attack, left off his attempts to understand the *olz* until he could better understand Bran.

Obviously Bran scorned the *olz*, but he hated the *rascz*, and that hatred had festered and swollen from the moment years before when he dragged his bloody body away to die. For years he had savored the revenge that would come when the *olz* turned on their masters. The savoring, the anticipation, were almost enough to satisfy him.

Now the terrible revenge upon which he had focused his existence for so long was exposed as ludicrous folly, and even the savoring was denied to him. The fury that unexpectedly lashed at the *olz* could also strike Farrari.

Farrari's instinct told him to leave immediately, but he could not. Bran was the one person who might be able to help him. In his uncertainty

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he did nothing, and several more days passed.

Then Bran became unaccountably cheerful, led Farrari about the valley to show him the networks of caves, reminisced voluably about his life with the *olz*, about the IPR Academy, and even resurrected forgotten memories of his childhood when he learned that he and Farrari came from adjacent star systems. At night he brought out crocks of wine he had made from *zrilmberries*—Thorald Dallum would have adored him—and for hours they sipped wine and talked.

The abrupt change of mood aroused Farrari's suspicion. After several such nights he began to wonder if Bran were not too generous with his wine while drinking too little himself.

Farrari awoke suddenly to find the sleeping room silent. Bran's quiet snores, his shallow, whistling breathing—he even breathed like an *ol*—were missing. Farrari checked Bran's empty bed and then, with a handlight, searched the cave. He went to the opening, sent a call echoing across the valley, got no answer. He felt his way through the darkness to the place where, under a ledge of rock, Bran had been keeping his platform. It was gone.

He returned to the cave and went to Bran's handmade communication center. At once he got a beam on a platform, approaching rapidly, so he switched off the instrument, returned to his bed, and feigned sleep. Bran shuffled in a short time later and went directly to his own bed.

The following night Bran left as soon as he thought Farrari asleep, and Farrari tracked his platform until it landed or his low altitude took him out of range. Half an hour passed, and then Farrari picked up the platform again, returning. The next two nights Bran remained in bed, and then he was off again—three expeditions in a row, all to widely-separated places. The pattern continued, days passed, and then Farrari, kicking himself for crass stupidity, thought to make further use of Bran's equipment and monitor the IPR communications channels.

Peter Jorrul's crisp voice: ". . . Mass movement of the *kru's* cavalry into the *hilngol*. At least six *durrlz* have been murdered, and in two instances an *ol* is known to have been responsible . . . presumed to have been an *ol* in every case, though probably not the same *ol*, the locations are too widely separated . . . no *ol* agents in the *hilngol* and a bad time to try to place one . . . possibly Farrari, but he couldn't have done all of it, no one person could be covering that much ground on foot . . . very much afraid a mass slaughter of *olz* is in the offing . . . comment and suggestions invited . . . no, requested . . . from all stations . . ."

Bran tiptoed into the dark cave, and an enraged Farrari seized him.

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"You've condemned to death whole villages of *olz*!"

"They're going to die anyway," Bran said indifferently. "They want to die. I'm making the *rascz* pay a little in advance."

Farrari released him. "Don't you see what you're doing? By arousing the *rascz* against the *olz*, you'll make it impossible to do anything meaningful to help them."

"I can go right on killing *durrlz*," Bran said. "That's meaningful. As soon as the soldiers get here I'll switch to another district. That'll give 'em something to think about."

"This is my fault," Farrari muttered. "I knew you were sneaking out at night. I should have stopped you."

"How would you do that?" Bran asked with a chuckle.

He dropped onto his bed and fell asleep at once, and Farrari went to work on the platform. He smashed the operating mechanism, went through Bran's stores looking for replacement parts and smashed them, and then he resolutely turned his back on Bran and the valley and strode off toward the nearest *ol* village.

"These *olz*," he told himself determinedly, "are mine." The *kru* and all of his minions of iniquity could take notice: this one small village was private property—Farrari's to cherish, to protect to the death if need be.

He could not have said why. The fate of one *ol* village in this land was as the fate of a drop of water in the ocean, and though the *olz* still fascinated him he neither loved nor respected them. Perhaps like Bran he merely hated the *rascz*, though more impersonally. He would have hated anyone who treated another living creature as the *durrlz* did the *olz*.

He joined the *olz* in the fields and immediately discovered his error. Bran had been too wise to carry on his depredations so close to his valley. These *olz* went calmly about their work. At mid-morning the *durrl* arrived, watched impassively, and continued on his rounds.

The soldiers certainly would not molest *olz* whom the *durrl* so obviously had under complete control. The village Farrari had lately sworn to protect did not need it. As soon as the *durrl* left, Farrari quietly made his own departure. He was determined to find a village that needed him, and he would have to travel fast. The *olz* he intended to protect might be dead before he reached them.

As he headed down into the lower *hilngol* the heat became sweltering. The ground underfoot was parched and hard, fields of grain had turned a mottled brown, and even the deadly *zrilm* leaves drooped and shriveled—and remained deadly. Farrari traveled south for no better reason than that he expected the soldiers to come from that direction, and he recklessly traveled by daylight because he could move fas-

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ter. He passed village after village of humdrum activity, forcing himself to hurry and at the same time trying to pace himself because he had no notion of how far he must go. The land, the people, the silly mission he had propelled himself on—all seemed unreal under the heat of a somnolent summer day, and so it happened that when he abruptly came upon a ravished *ol* village the sight stunned him.

The lane took a sudden turning, and before him lay the still-smoldering ashes of collapsed huts and the pathetic scattering of dead *olz*, and the clinging, sweetly rancid odor of burned flesh seared his nostrils. Farrari gripped his staff with trembling fingers and contemplated the holocaust. These were the *olz* who should have had his protection, and he was too late.

Not until then did he notice other plumes of smoke pointing skyward against the scorching sun.

A shout and the patter of many small hooves shattered his bleak mood and sent him scrambling for a *zrilm* hedge. Moments later he saw the prancing *gril* legs as the *kru's* cavalry flashed past. Farrari acted without thinking: he thrust his staff through a tangle of *zrilm* roots and braced himself, and he was quite as astonished as the rider must have been when a *gril* stumbled and crashed to the ground.

A bundle of spears dropped beside the hedge, and Farrari gathered it in, slipped through the opposite side of the hedge, and trotted along the edge of a field of tubers. At the end of the field he poked his way back through the *zrilm* and looked up the lane to where the soldiers had gathered about the fallen *gril*. Thoughtfully he balanced a spear in his hand. He stepped into the lane, took aim, and let fly.

With a dozen soldiers and *grilz* blocking the narrow lane he thought he could not miss; but the light spear, perfectly designed for throwing, whipped unnoticed above the heads of the soldiers.

Farrari's second attempt grazed a *gril's* flank. The beast reared and screamed, the soldiers turned their attention to the *gril*, and so little were they accustomed to being on the *receiving* end of thrown spears that incredibly they failed to notice Farrari.

He did not believe in pressing his luck. He filled the air with his remaining six spears, throwing as fast as he could take aim. Then he ducked for cover, and as he vanished into the hedge a spear whistled past his head, a snap throw by an expert and a sobering reminder to do his future target practice from concealment. Peering through the hedge, he noted with chagrin that all of his spears had missed. The soldiers made a hasty retreat with their dismounted comrade riding double, and as soon as they disappeared Farrari darted into the lane in search of spears. He found two and retired to the hedge to plan his next move.

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The soldiers would be back. At this moment they were probably in conference with their commander, trying to convince him that they had not imagined an *ol* throwing spears at them, and when the commander had given the matter sober consideration he must conclude that an *ol* uncommon enough to throw spears could be the same one who'd been uncommon enough to stab *durrlz* in the dark. The soldiers would be back.

And Farrari would be waiting, though not where they expected to find him. He moved some distance down the lane, found a place in the hedge that satisfied him, and made himself comfortable. He watched and listened, and soon he discovered that the pattern of hedges had a distorting effect on sounds. Some were blocked out, others were amplified and their direction confused. Several times Farrari thought he heard *grilz* approaching, and when they finally came he did not hear them until they were almost upon him.

As he peered out cautiously, he was dumbfounded to see the third *gril* of the column crash to the ground, and an instant later a spear whistled from the opposite hedge and neatly impaled the leading trooper. He fell and his *gril* ran off braying wildly. Farrari managed to launch his two spears before the soldiers fled. He missed, but two more spears from the opposite hedge caught retreating soldiers squarely in their backs.

Farrari stepped from the hedge to survey the carnage: Three dead soldiers, one dying *gril*. He called out guardedly, "Who are you?"

The *zrilm* parted. Bran's ugly face grinned out at Farrari. "I got to hand it to you," he said admiringly. "I never thought of this. It beats killing *durrlz* in their sleep."

"How'd you find me?" Farrari demanded.

"Wasn't hard once I found out what way you were going. I just kept flying on ahead and waiting for you to catch up."

"Flying—"

"Oh, that." Bran shrugged. "I got two more platforms."

"How'd you get so proficient with spears?"

"I dunno," Bran said. "I just aim and throw."

"That's all I do," Farrari said, "but I never hit anything."

Farrari helped himself to a bundle of spears. Bran hurried to claim another, and they divided the third. Farrari could not help thinking that it was Bran who had destroyed this *ol* village, but recriminations would not have helped the dead *olz*. On the other hand, a show of resistance here would keep the *rascz* from killing *olz* elsewhere. Bran enjoyed killing soldiers; let him help.

"They'll be back," he told Bran, "but they'll take their time about it and maybe send for reinforcements. If they have any military sense at all, they'll change their tactics. If I'd paid

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more attention to Semar Kantz, maybe I'd know what they'll do."

Bran stirred impatiently. "Let 'em come," he said.

"We'll try a new location," Farrari decided. "It'd be a mistake to always ambush them at the same place. And then we'll separate: me on one side, you across the lane fifty meters away. Whichever way they come from, we'll hold our fire until we have the whole troop between us. And once the fun starts, they'll think there are more of us if we duck through the fields and take up new positions."

Bran grinned and nodded.

"Let's find a place we like, then, and get under cover."

They moved beyond the smoldering village and set their ambush. Time passed; nothing happened except that a large, multi-legged insect ran across Farrari's bare leg and each foot punctured the skin. He stared in amazement at the double row of tiny blood spots, for he'd felt nothing at all, but a short time later the leg began to throb and swell. It was a horror the specialists at base had failed to mention.

The pain grew worse. Finally Farrari hobbled down the lane to Bran's hiding place, and Bran took a look and grimaced. "Oh, one of those. Tomorrow you won't be able to walk."

"I can hardly walk now," Farrari said disgustedly. "How long does it last?"

"Couple of days, unless I got a medical kit in the platform. I kept one in the other platform," he added accusingly, "but I don't remember if I got one in this one. I'll go look."

"Be careful," Farrari cautioned. "Keep to the fields as much as possible."

Bran nodded, parted the hedge, and scurried through. Farrari followed him and sat down by the hedge to watch Bran lope off across the field. After a time he felt uneasy in the open, even in a *zrilm* enclosed field, so he crept back into the hedge and waited there.

Then a squad of cavalry came down the lane. Farrari fingered his spears longingly but did not throw—an ambush seemed perfectly safe to him as long as he could hit and run, but he could no longer run. He watched the squad pass, instantly concerned about Bran—because these troops rode walking *grilz*, and a walking *gril* made no noise at all. It suggested that the *rascz* were setting up an ambush of their own.

As soon as the column passed, Farrari started after Bran. He used his staff as a crutch, but stumbling around the hills of tubers made slow and painful going. He crossed several fields and finally came to a lane, where he cautiously parted the *zrilm* and looked through.

Bran lay a short distance down the lane, his body bristling with spears. Farrari staggered to his side, but he knew before he reached him that he would be dead, that no one could

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survive so many wounds in vital places.

He paused there only for a moment, but when he straightened up the cavalry troop was almost upon him. With two good legs he might have reached the hedge—barely—but he could manage only a staggering lunge before the spear crashed into his side. As he hit the ground he screamed—or tried to scream—*"skudkru,"* but the second spear was already on the way.

XV

It was night, and he was being carried. The soft breeze that rattled the dry *zrilm* leaves felt numbingly cold to his feverish face. Stars floated dimly beyond a swirling film of smoke and haze.

The air was pure on Branoff IV. The nights were clear or cloudy, and there was no haze.

He blinked, and the haze remained.

He became aware of a new sensation: from far away, as though through a different kind of haze, he heard singing. He thought he grasped some of the words, *ol* words, and he told himself, "Impossible! The *olz* have no culture. They can't sing. No one has ever heard an *ol* sing."

The song continued, a solemn, stirring, rhythmic exaltation; an unfettered, searing, lilting outpouring of emotion; a prolonged lament of triumph suspended above the quite irregular, thumping beat of death.

His one recollection was of the second spear hurtling toward him. He started through the haze at the starry night and listened through the haze to the stirring *ol* song, and he decided that he was dead.

It was day, and he lay in the shadow of a *zrilm* hedge. Insects had found his clotted wounds, and their furious buzzing throbbed thunderously. He willed himself to brush them away, but his hand did not move. He was alive, and he had dreamed the night sky and the singing, but he could not remember how he came there.

It was night. Again he was carried, but now the haze had swallowed the stars. Strangely enough, he could hear clearly. The singing at which he had marveled sounded loud and close at hand, and he discovered it to be the unsyllabic, unintelligible grunts of *olz* at work. He had a sensation of falling until he realized that his head was lower than his feet. On and on he was carried, down and down, louder and louder sounded the grunts of the laboring *olz* as every sound echoed and magnified, and suddenly light bloomed to flash and sparkle above him.

He was in a cave, and tiny stalactites formed a lacy fairy mist on the irregular ceiling. Then the ceiling veered beyond reach of the flickering torches and a blast of cold air struck him.

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Lowered to the ground, he rolled helplessly down a slight incline and came to rest on his side, and with a shuddering finality he knew that he was dead. Directly before him rose a vast pile of the pathetic, inert bodies of *olz*, and even as he was comprehending what it was hands lifted him and placed him upon it. He was one with the dead *olz*, and the living *olz* had brought him here for burial.

He was alone with the dead. Water, dripping from somewhere far above, sounded random drum taps on the piled bodies. The flush of fever had faded. He felt cold, drained of life, and his only thought was that eternity, in such a place, would be very dull indeed.

He slept, and when he awoke he found himself able to turn his head slightly, wiggle a finger, lift a hand a centimeter or two. He was alive, but paralyzed by weakness, and the *olz* had interred him with their dead.

The *olz* returned. Farrari watched the flickering shadows thrown by their torches and listened to the padding of their bare feet. Their shuffling footsteps receded into the depths of the cave, returned, encircled the mounds of dead. Abruptly a voice was raised in a strange, rhythmic chant of *ol* speech sounds intertwined with guttural nonsense. The chant performed an endless dialogue with its own echoes, the footsteps receded and returned, and finally Farrari became aware that there was a pattern, a cycle to what the *olz* were doing. From a whispered beginning the chant crescendoed to a shout followed by abrupt, motionless silence. This was repeated several times, the procession receded into the distance and returned, and a new cycle began.

Hands removed a body from the pile upon which Farrari lay. He tilted and began to roll, and the hands eased him to the ground almost as gently, he thought, as though he'd been alive. With an exhausting effort he managed to turn his head, and he could now witness the dancing, chanted death rites of the *olz*.

They gathered around the body, and a priest in fluttering robes performed a contorted, leaping dance. The priest—priestess, Farrari decided, or young priest—began the whispered chant, his dance became wilder, his voice louder, and he leaped through the flaming torches and returned again and again to the dead *ol* whom the living encircled, embracing the fire of life in a dance of death, and the chant took on melody and lilt and began its remorseless crescendo. Then four *olz* sprang forward, seized the dead *ol*, and flung him into the air.

The chant ceased abruptly; the body disappeared. Although Farrari could not see it, he surmised that there was a chasm or crevass, a bottomless abyss, so deep that bodies vanished into it soundlessly, and here the *olz* disposed of their dead.

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The specialists at base would have been fascinated, but this priceless discovery seemed likely to die with its discoverer. The *olz* padded back from the depths of the cave, and the next body they took was Farrari's.

He lay on his back at the center of the circle of mourners. The priestess began her dance, began the chilling, whispered preface to her chanted lament. The ceiling arched far above the shallow circles of light thrown off by the torches, and Farrari, looking upward, could see nothing at all. Occasionally the priestess brushed past him; once she fluttered her hands before his staring eyes. Her chant became louder, her dance more agitated. Suddenly she appeared above him, her weirdly dilated eyes fixed on his face, her features contorted, her lips shaping shrieking incantations, her face—

He screamed, "Liano!" but the cry, if he forced one past his parched lips, was drowned in her chant. Her voice reached its shrill climax, and the *olz* leaped forward to seize him.

He had strength for one feeble effort. He moved his hands; his head lolled to one side and then straightened.

It was enough: the dead had come to life in the sanctuary of death. The chant stopped abruptly, the four *olz* backed slowly away, and Liano halted in midstride. Shocked out of her trance, she came closer and suddenly recognized him.

She screamed.

The *olz* fled, Liano with them, and Farrari was alone with the dead and the sputtering torches.

He was carried again. Remembering the abyss of the dead he attempted to struggle and his weakened muscles made no response. He thought the direction was upward, but he could not be certain until they emerged under a graying night sky. The *olz* carried him a short distance to another cave and gently placed him on a pile of straw.

They patiently fed him water and gruel, a drop or a grain at a time, and Liano bathed his wounds and dressed them with rags of coarse *ol* cloth. There followed an agonizing hiatus during which his fever returned and his mind wandered, and he called repeatedly for Liano and she did not respond.

Then she was with him again, and the unlighted cave seemed less dark when he knew that she was close by. She replaced his coarse bandages with real ones, applied medicine to his wounds, and gave him capsules to swallow, and he dimly perceived that she had visited one of the IPR supply caches. His fever broke, but he remained pathetically weak. He lay on the straw in the dark cave, listless except when they attempted to move him outside. This he resisted fiercely. In the darkness he had formed an inexplicable fear of daylight. Liano sat by his side for hours at a time trying to coax him to eat.

Slowly his strength returned. He

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became aware that several *olz* were in constant attendance on Liano, and he meant to ask her how a *yilesc* could have so many *kewlz* but forgot; and then when he remembered he had deduced the answer himself: there was, had to be, a supreme *yilesc*, or several of them if there were several burial caves where the *olz* disposed of their dead. IPR's synthetic *yilescz* would not be aware of them, but Liano's clairvoyancy had penetrated to that knowledge and beyond. She had become a supreme *yilesc*.

Finally Farrari consented to being moved outside, and Liano fed him IPR rations and he began to recover his strength rapidly. He missed Bran—missed having someone to talk with. The *olz* did what he asked and otherwise cautiously kept their distance from the *ol* who had returned from the dead—and it was anyway impossible to converse in *ol*, a language that even simple communication sometimes taxed to the utmost. Liano conscientiously dressed his wounds and fed him but hardly exchanged a word with him.

He dreamed of a carefree world where they could run hand in hand, laughing, through verdant mountain meadows. He had never seen her laugh; he had never dared to touch her hand. He remained the lowly *kewl*, and she was elevated to the loftiest of *yilescz*.

On an impulse he said to her, one day when she brought his food, "You foresaw this, didn't you?"

She turned a startled, wide-eyed gaze upon him.

"You foresaw that I'd be wounded?"

"I . . . yes—"

"Was that the real reason you took another *kewl*? To keep me at base?"

"I saw you lying in the road," she said slowly. "And the spears, two of them. And the *kru's* cavalry riding past. I thought you were dead. So I told Peter you'd never learn to think like an *ol*."

"Since I've survived that, after a fashion, what'll my next catastrophe be?"

She stared at him.

"What do you see in my future?" he persisted.

"Nothing."

"Nothing at all?"

"Nothing."

The next morning she was gone.

Farrari made a frantic search for her and finally found his way down the steep slope to the valley below, where he had seen an *ol* village. There he met the *olz* who had been taking care of him, but he did not know what they called Liano, and when he mentioned *yilesc*, a *Rasczian* word, they did not seem to understand. Probably she had fled with a *kewl* and a *narmpf* and cart, but he was much too weak to try to follow her. He could not even negotiate the path back to the cave, so he remained in the village.

The *olz* who lived there were the strangest he'd seen. They had ample

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rations and lavish supplies of *quarm*, and yet they did no work and no *durrl* harassed them. They started their nightfire at dawn and most of them slept through the day.

They were caretakers of the dead. At night some went forth and returned with dead *olz*, whom they carried to the burial cave. Others performed nightly obsequies in the cave. After Farrari became stronger, he went several times to the cave and remained in the background to observe. He saw the same shuffling ceremony he remembered, but without their supreme *yilesc* the *olz* performed it silently and committed the dead to the abyss without a spoken blessing. There was another peculiar difference: At intervals an *ol* would loudly grunt a word and all would collapse in silent prostration. Farrari puzzled long over the word, which meant *speak*, or *talk*, or *answer*. He could not decide whether they were importuning the absent *yilesc* or the silent dead; but the *yilesc* remained absent and the dead never spoke.

One morning Farrari climbed to a place of privacy a short distance above the village, found a comfortable clump of grass to sit on, and sternly told himself that if he were too weak for action he at least had no excuse for not thinking. He knew more about the *olz* than any non-*ol* on Branoff IV except Liano, who kept what she knew to herself, and he should be able to put that knowledge to use.

He suspected that the cave with the *ol* carvings in Bran's valley had been a burial cave, which meant that the *olz* had not changed their method of disposing of their dead since those remote times when they were masters of Scorvif. The fact that the *rascz* not only tolerated this, but encouraged it by supporting the village of caretakers, meant that they somehow found it to their own advantage.

When an *ol* died, the *olz* of successive villages passed his body along until it reached a collecting point, from which the caretakers took it to a burial cave. There were probably several of these, each with its village of caretakers—one in each of the finger valleys, others around the perimeter of the *lilorr*. As for what the *olz* did with the piles of dead that accumulated during the winter or during epidemics, he hesitated to speculate. He felt certain that the distances some dead *olz* were carried would tax the credulity of an outsider.

What else did he know? That the *olz* wanted to die. Bran had grasped that, though for the wrong reasons. What, then, were the right reasons?

The *olz* wanted to die, but they never committed suicide.

The *olz* worshiped their masters, who starved and murdered them.

The *olz* made no effort to escape, no effort to defend themselves, no effort to secure a scrap of food more than what they were given even when starving.

They wanted to die, but their religion forbade suicide as well as vio-

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lence and the taking of each others' lives. Since they were forbidden to kill themselves or each other, could it be that they worshiped their masters *because* they starved and murdered them?

"A death cult!" Farrari exclaimed. "A people whose lives are dedicated to one thing and one thing only: dying!"

But *why* did they want to die? The end of all life was death, and anyone who meditated excessively upon that fact could in time develop a morbid philosophy. Even among a peaceful, prosperous people there would be diseases, accidents, frustrations, tragedies, and if their religion taught that death was a welcome release from life, that it brought instant translation to paradise, Elysium, eternal bliss, a people could come to prefer death to life. And if the people were conditioned to this preference from infancy—

He leaped to his feet excitedly. His first contact with the *olz* had come by way of a teloid cube that projected an *ol* woman being beaten to death. In the background several *olz* stood looking on, and Farrari had pondered the expressions on their faces.

He remembered them vividly: two men, a woman and a child watching a murder, and their faces expressed—ecstasy! Ecstasy and envy! They wanted to die, they envied those who died, they worshiped their conquerors who brought death to them with such lavish generosity.

The *rascz* had exploited this aberration cunningly, even working women of their own race into the *ol* religion to encourage the *ol* obsession with death. A people intent on dying would be very unlikely to revolt, and the *olz* never had.

Farrari sank back into the grass, made himself comfortable again, and asked himself a crucial question: Why had the IPR Bureau learned so little about the *ol* religion?

The olz *had recognized the IPR agents!* Not as aliens from outer space, they could not have comprehended such a concept, but they had recognized them as outsiders, and while they seemed to accept them and behave normally toward them, they kept to themselves matters that concerned only themselves.

Such as the *ol* religion.

Even Bran, as complete an *ol* as IPR had produced, knew nothing about the *ol* religion.

Now that Farrari did, or thought he did, he faced the problem of what to do with his knowledge. If he returned to base with it he would be a hero of sorts, in spite of his violation of regulations, and his information would be the subject of innumerable reports and would produce no result whatsoever. Farrari was laboring for the benefit of the *olz*, not the IPR files, so he would not return to base.

What he would do he did not know, but while he was deciding, and regaining his strength, he deter-

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mined to learn the *ol* language—not the IPR version, but the genuine *ol* language, which Bran seemed to have glimpsed and Liano possibly knew something of, but which no other IPR agent knew existed.

He began at once. At night he visited neighboring *ol* villages openly, seeking news of Liano. He returned surreptitiously to eavesdrop, to listen for hours to the grunted speech around the nightfires when the *olz* did not know an outsider was present. He hid in the cave and listened to the death rites.

And he detected no differences, none whatsoever. Spoken privately, *ol* was the same threadbare remnant of a language that he had known from the beginning.

XVI

For the fourteenth time—Farrari was counting them—an *ol* mouthed the word, *speak*, and the *olz* fell prostrate.

Farrari watched from his usual place of concealment. He entered the cave before the *olz* arrived and left after they did, and he had explored the enormous room as thoroughly as its gaping chasm permitted and selected his observation post with care. He had witnessed this identical scene from fifteen to forty times on each of six successive nights, and suddenly it occurred to him to ponder—if the *olz* were indeed pleading with the Dead—what the Dead might answer. He was tempted to speak himself, as an experiment, but he feared that the effect would be somewhat marred if the Dead spoke from the wrong direction.

He waited until the *olz* departed, and then he lit a torch and made a painstaking examination of the edge of the chasm. At one point tenuous footholds led down to a narrow ledge. Spending a night there would be acutely uncomfortable if not exceedingly dangerous, and he was willing to suffer both in a good cause.

His problem was to think of a good cause.

In his mind he began to sketch out a plan for a new chapter in the IPR Field Manual: RULES TO BE OBSERVED WHEN THE DEAD SPEAK.

Plan message carefully.

Aim at conciseness (lest the Dead appear to be unnaturally long-winded).

Make message portentous (if the Dead stir the dust of silent centuries to discuss the weather, it will seem anticlimatic).

Strive for credibility (as though anyone could know what an *ol* would consider credible in the way of a message from the Dead).

And what could the Dead possibly say that would in any way alleviate the suffering of the *olz*? "They might suggest that the afterlife isn't all that the *ol* faith implies," Farrari mused. "Enjoy life while you can; Eternal Contentment is a colossal bore."

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But it was much too late for that. The *olz* had long since forgotten how to enjoy anything–so much so that the *ol* language, or what Farrari knew of it, had no word for pleasure.

He climbed the mountain to a point far out of earshot of the village so he could practice making sepulchral sounds, and he quickly satisfied himself that he was in fine voice for forwarding a message from the Dead. But what to say?

Looking out over the valley, he saw the local *durrl* riding along a lane. His assistants occasionally brought supplies, but he never came near the caretakers' village himself. Farrari glared after him for a moment and then croaked good-naturedly in *Rasczian*, "Bring . . . me. . . his . . . head!"

This thought moved him to add one more rule to his list: *Make message reinforce belief, not contradict it.* If the Dead were to preach hatred of the *durrlz* and demand revenge on them, the *olz* would be confused and horrified. To conform with the *ol* religion, the Dead must not order punishment for the *durrlz*, but a reward.

"And under the *ol* religion, what is the greatest reward that one can give?" Farrari asked himself.

Death!

The cry, "Speak," and then silence.

Crouched on his ledge, Farrari spoke one *ol* word, a generic sound that indicated any of the *Rasczian* race. Only the quick, shallow breathing of the *olz* ruffled a silence that seemed interminable. The ceremonies resumed, and at each subsequent invocation of the Dead Farrari patiently inserted his word–and the *olz* ignored him.

At dawn he crept to his hiding place for a badly needed rest, and then he descended to the village. A few *olz* were grouped about the fires, others were asleep, and if any thought it worth remarking on that the Dead had at last broken their long silence, they spoke out of Farrari's hearing. For three more nights he played the role of the Dead; for another three days he prowled the village straining to overhear some reference to it. He heard nothing.

"Very well," he told himself grimly. "When they arrive at the cave tomorrow night they'll find a *rasc* corpse ready for burial and the Dead howling for it, and let's see if they can ignore that."

At dusk he set out for the *durrl's* headquarters. He'd had a distant view of it from the mountain side–a large dwelling, several smaller ones for assistants and servants, and a ring of stone outbuildings of various sizes encircling them. In the darkness he glided wraithlike among the buildings and came, finally, to one of the smaller dwellings. Looking through a window slit, he saw a touching domestic scene: father and mother at play with two charming children. Shaken, Farrari crept away slowly and fumbled his way back to the *zrilm*-lined lane.

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"Killing a soldier who—given half a chance—will kill me first is one thing," he muttered. "But killing in the dark just to provide a corpse is murder. And even if I did provide the corpse, what would the *olz* do with it?"

They would worship it, no matter how loudly the Dead howled. He had been that route before, with Bran. Perhaps the *olz* wanted to die, perhaps their religion was centered on the worship of death, but the place to study its effects was not among the caretakers, the most extraordinary of all *olz*. He should do his experimenting at the normal villages. He also should get out of the *hilngol* and see how the *olz* lived and behaved elsewhere.

And he could start at once. He had no reason for returning to the caretakers' village.

A *gril* brayed. Farrari straightened up thoughtfully. "Riding," he told himself, "has several obvious advantages over walking, especially when one wants to cover ground quickly. The question is whether a *gril* sees well enough at night to avoid *zrilm* hedges, because the results of a high-speed encounter could range from unpleasant to fatal. There is also the question of what might happen to an *ol* caught riding a *gril* in the daytime, and that's likely to be much more fatal."

He balanced his urge to be underway against the much better time he could make riding and decided to investigate the problems encountered in *gril* thievery. He sought the shelter of a *zrilm* hedge and went to sleep, and shortly before dawn he took up a position behind a gap in the foliage to see what he could learn.

Two of the *durrl's* assistants appeared, dim figures in the wasting pre-dawn darkness, and a short time later they were off with *narmpfz* and a wagon load of the rickety wood stiles. At full dawn the *durrl* and another assistant rode away on *grilz*. The first assistants returned, unharnessed the *narmpfz*, and led them through a narrow gate in the *zrilm* at the opposite side of the clearing. They reappeared mounted on *grilz*. The chimneys of the various dwellings began to send forth thick outpourings of oily *quarm* smoke. At midmorning the *durrl* and all of the assistants returned for a leisurely first meal, their stiles in place, their *olz* docilely at work, their *narmpf* rashers crisply toasted, and all right with the world.

Farrari's thoughts were with the *olz* left in the fields: the rising sun in a clear sky that foretold a day of relentless heat; the crude, short-handled, stone-tipped tools; the length of a row of tubers as measured with bent knees and back.

He studied the complex of buildings with interest. The largest outbuilding would be a barn for *grilz* and *narmpfz*, though the animals obviously remained in their *zrilm*-enclosed pasture in summer. The other outbuildings would be used for various kinds of storage. He thought it

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odd that he had never seen a teloid of such a scene. Undoubtedly base had some—IPR was much too thorough to overlook anything this prominent—but none of the specialists had been interested enough to point them out to Farrari. That was another oddity, because the *durrl* and his establishment were unique. He and his assistants were the only bilingual class in Scorvif.

A sudden awareness of hunger and thirst reminded Farrari that he had not regained the fine edge of his *ol* conditioning. The *durrl's* well was enticingly in sight and hopelessly out of reach. He shrugged off his discomfort and continued to watch.

After the men left again, the women began to spread laundry on drying racks, and Farrari reflected that at some stage in its development every civilization discovered cleanliness. Whether its obeisance was strict or casual, frequent or infrequent, the rites had to be performed by someone. In a majority of civilizations, the principal task of the female was keeping the male clean.

Through much of the morning the children played a quiet game, gravely sitting together in twos and interchanging partners in some complicated pattern, but the changes were performed at a sedate walk, and the talk was too subdued to reach him. He heard no laughter. Finally they took that game or another out of sight behind the buildings.

This was indeed the high holy day of the immaculate god, and as soon as the clothing dried it was taken down and replaced. The uninterrupted outpouring of smoke proclaimed the continuous heating of water. Another column of smoke occupied his attention for a short time, but he soon identified the small building as a smokehouse.

He grew bored, his discomfort increased, and long before dusk he was cursing himself for his stupidity. So distressed was he that when the women racked their final offering of wet clothing in the fading light he at first paid no attention. Then he perceived, dimly, a long row of the cloaks worn by the *durrl's* assistants.

"It wouldn't be healthy for an *ol* to be caught riding a *gril*," he mused, "but why do I have to be an *ol*?" The hood that protected the wearer from the sun might—almost—hide his low *ol* forehead.

The day's work ended, and the two assistants with the creaking wagon load of stiles were the last to appear. As the sound of their talk faded toward the dwellings Farrari crept out and followed them. He drank deeply at the well, sniffed his way into the smokehouse and ate with relish several long shreds of smoked meat, returned to the well, and then cautiously approached the laundry racks.

He found a cloak without difficulty, but he had to search for some time to locate a lower garment, and he quickly abandoned the notion of identifying undergarments in the

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dark. He folded up one of the lengths of cloth that constituted a woman's robe. Back at the smokehouse he ripped a piece from it and was using it to make up a package of meat when he thought about boots. Whoever heard of a barefoot *durrl's* assistant on a *gril*? Or anywhere else?

Common sense told him to forget it. He was rested, he had meat to eat, and he knew how to travel safely as an *ol*. He knew nothing at all about traveling as a *durrl's* assistant, he had no plans, he still was uncertain as to where he was going—but he could not resist the alluring opportunity to get there quickly. He dressed himself in the stolen clothing and cautiously circled one of the smaller dwellings.

Again he peeped through a window slit at a touching domestic scene, but this time he was interested only in the master's feet. Having established that a *durrl's* assistant did not wear his riding boots in the house, he continued his search. In an attached shed he happened onto boots, three pair of them, and their pungent odor was reason enough for not wearing them inside. All three pair were several measures too small for him.

He felt both chagrin and alarm. He did not recall that his feet were noticeably larger than those of either *rascz* or *olz*. Was it possible that all this time the *olz* had been referring to him behind his back as *big feet*?

He moved to the next dwelling, found the shed, found four pair of boots. These were large enough, and he took the pair that seemed, in the dark, to be the most worn, and, therefore, less likely to be missed. He put on the boots, helped himself to a harness from the peg on an outbuilding where he had seen a *durrl's* assistant hang it, and went to see what might be involved in catching a *gril* at night.

Five of them came to meet him. He was an eternity in getting the harness strapped into place, and when he finally led his *gril* away the others followed. He left the gate open so that it would look as though they had strayed accidentally and headed toward the nearest lane with a procession of *grilz*.

When he reached it he shooed the other *grilz* away and mounted. His *gril* stood motionless, waiting. Cautiously—Farrari well remembered the recklessly dashing *grilz* of the *kru's* couriers—he shook the harness lead, bounced up and down, gently prodded its sides with his boots, tentatively slapped its flanks. It remained motionless. He spoke certain *Rasczian* words that had to do with forward motion. Then he recited all the *Rasczian* profanity he could remember. He pulled the *gril's* ears, individually and collectively. He dug his heels into its ribs and slapped it smartly. It remained motionless.

Becoming angry, he jerked sharply at its harness, whereupon the *gril* moved forward. He quickly determined that it could either see or smell the *zrilm*, for it kept to the center of the lane and moved at a steady

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walk. Eventually Farrari would have to learn how to make it go faster, but he would prefer to do this in daylight and in a wider lane.

As the night passed he became more confident. Shortly after dawn he came upon an *ol* village, but the *olz* had left for the fields. He watered the *gril*, and then he drank himself and munched smoked meat while the *gril* grazed. In daylight he quickly learned to manage it, but by midday the animal had him seriously worried. It would not eat. It grazed when it could, but desultorily, as though seeking something edible and not finding it. He could not bring himself to rob the scant *ol* stocks of grain, which meant that his movements were to be more limited than he had supposed, and more risky. Each night he would have to rob a *durrl*.

He rode during the hours when the *rascz* were unlikely to be about, raided a *durrl's* headquarters when he happened upon one, and learned to carry a reserve of grain in strange, tubular grain sacks that were to be found in every *durrl's* storage buildings. He also learned that a tall *zrilm* hedge would harbor both his *gril* and himself. The *olz* he saw averted their eyes until he had passed, and he had the good fortune not to encounter a *rasc*.

After riding south for three days he decided to turn west and cross the valley. The *gril* was plodding through the darkness, with Farrari half asleep on its back, when suddenly its hooves clicked sharply on stone. Farrari halted, dismounted, and found that he'd discovered a road. He turned the *gril* south, and at dawn he was moving along a straight, masterfully engineered highway built of the same kind of massive stone blocks he'd seen near Scorv. It was in much better condition than the road near the capital, probably because it had less traffic.

And he had been plodding through all the overgrown back lanes in the valley when he could have been racing along this thoroughfare! If he'd had any place to go, his dimwittedness could have had serious consequences, because he should have known that there'd be a highway. The pass at the head of the *hilngol* was the most vulnerable leading into Scorvif and the military post there the most important. The *rascz* were expert military tacticians, and this road certainly had not been built for the convenience of *durrlz* bringing grain to market.

He urged the *gril* to a faster pace and began to teach himself how to ride. As day come on he began to meet and overtake a scattering of traffic: military wagons, the rare citizen *rasc* bound for the garrison town at the head of the valley, a troop of cavalry sweeping along in single file. No one paid any attention to him, and he quickly decided that he was safer on the highway than in the lanes. Strangers were the rule on the highway, but in the back country a

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strange *durrl's* assistant might be required to explain his presence.

He had to leave the highway and search for a *durrl's* headquarters when he needed grain, but he made excellent progress. He was far south of Bran's valley and approaching the *lilorr*—and beginning to wonder what he would do when he got there—when he found the *ol*.

He had made a night raid on a *durrl's* headquarters and was returning to his *gril* when he stepped heavily on a *quarm* log someone had carelessly left in the lane—except that *quarm* logs did not moan when stepped on. With fumbling fingers he pieced together the story of what had happened: the *ol* was on a special errand, alone, bringing a heavy basket of seed tubers from the *durrl's* headquarters for the morrow's planting. He had collapsed under the load. A *durrl's* assistant would find him at dawn by running a wagon over him, but by then he would be dead.

Farrari returned to his *gril* and rode slowly along the lane, searching for the flickering light and pungent odor that marked a nightfire. He found one and rode up to the circle of *olz* gathered for their evening meal. As he abruptly loomed over them they quickly lowered their eyes.

He spoke a single word: "Come!" And turned and rode away.

When he glanced back the entire village was on the move. One *ol* led the way with a burning *quarm* branch, and others were lighting branches and joining the procession at regular intervals. The next time Farrari looked back the lane was filled with plodding *olz*.

He led them to the fallen *ol* and stood by while some carried him away and others searched the grass for the spilled seedlings. They were headed back to their village, the last of their torches vanishing around a turning in the lane, when Farrari realized that he had not spoken to them a second time.

He sat on his *gril* looking after them long after their torches had disappeared. He had spoken a single word, "Come!" And the *olz* followed him without question. The entire village followed him.

Such was the stuff that revolutions were made on.

XVII

The valley widened; the mountains diminished to an irregular, blue smudge on the east and west horizons. On the day that they completely disappeared the road divided, one branch curving away to the west, and above the intersection loomed a ponderous stone building.

Farrari had his *gril* moving at a loping run, so he flitted past, slowly brought the *gril* to a walk, and nudged its neck to turn it toward a lane. A short time later he was studying the building from the shelter of a *zrilm* hedge.

He could not make out what it

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was—only that it was huge and very ancient, and that the long ramps leading to its various levels stretched out like arms poised to entrap the unwary. He wondered if it were another *ol* monument.

There seemed to be no one about, but a trickle of smoke came from the large dwelling that stood amid the usual complex of smaller buildings a short distance away. Cautiously Farrari moved along the hedge, and when he passed the corner of the building he came upon an outside storage area filled with empty grain crocks.

It was a food-storage depot, and Farrari had never seen one. When Strunk selected teloid cubes for the Cultural Survey trainee he obviously did not consider food storage depots to be art, and this one wasn't. It moved Farrari to think about engineering and military science, rather than architecture. This massive pile of stone could easily have served as a fort, and perhaps it once did.

He continued to puzzle at the lack of activity until he remembered that a granary was not run like a mill, that had to be operated. This time of year no one would be bringing grain for storage, and with the first tuber crop already harvested there would be little need for withdrawals—except for the one Farrari proposed to make as soon as darkness came.

Until sunset he explored the surrounding country, and then he returned to the granary, rolled a sealed crock down the ramp and across rough ground to the concealment of a *zrilm* hedge. As long as he remained in the neighborhood, he would be relieved of the necessity of pilfering grain from the *durrlz*.

Instead he stole *grilz*. He found a triangle of rocky land almost enclosed by the *zrilm* hedges of surrounding fields, and he cut *zrilm* branches to plug the opening, changing them frequently so they would look like a continuation of the hedge. There he kept his *grilz*—the one he had been riding and three others he stole from widely-separated *durrlz*. He took them out each night to feed and water them, rode them in turn, and continued to explore, and with a bit of charcoal he began to sketch a map on the roll of cloth he had brought with him.

The lanes produced a fantastic complex of crisscrossing lines, and *ol* villages blossomed on them with a regularity that left him breathless. He began to speculate as to the total *ol* population of Scorvif, and then, incredulously, he attempted comparisons with the *rasc* population, whose numbers he did not know either. Was it remotely possible that the *olz* outnumbered their conquerors several hundred to one?

He made plans. The *rascz* were brilliant military tacticians, everyone said so, and Cultural Survey AT/1 Cedd Farrari knew next to nothing about military tactics. He did not need to be told that the task of outwitting them was a perilous one.

He followed the highway south for

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two days and nights; followed its branch west for two days and nights. He found a small *rasc* town where the road passed near the western mountains, but no military garrisons. Barring the chance presence of passing troops, a revolt in the lower *hilngol* would be free from military interference for at least four days. "The best way to defeat a foe with superior military skill," Farrari told himself, "is to attack when he's not around."

He widened his range of exploration and once again began to steal from the *durrlz*—not grain, but the tubular grain bags. He laid out a route on his map and reconnoitered it carefully, calculating distances in the slouching *ol* pace. Suddenly he was ready, no reason to delay longer, nothing ventured nothing gained, nothing at all would come to an IPR agent who waited except old age, and old age on Branoff IV wasn't worth waiting for. He rode out of the night to loom over the nightfire of *ol* village One. "Come!"

Bearing torches, they followed him. Villages Two, Three, Four—the ranks of Farrari's army swelled and his confidence soared with each new addition. The route to village Five followed a long stretch of straight lane, and when Farrari looked back it seemed to him that there were very few torches behind him. He turned to investigate and came much too quickly to the end of the column. Only the *olz* of village Four were following. The others had gone back.

He hurriedly retraced his steps. At village Three he found those *olz* resuming their meal around a replenished nightfire. Village Two, village One—his schedule was ruined, but stubbornly he started over again. "Come!"

When he reached the same stretch of straight lane, only the *olz* of village Four were following him. He grunted the word that sent them back to their village and retired to a hiding place to think.

He had been certain that the *olz* traveled long distances carrying their dead, but perhaps they merely passed them from village to village. His own memories of the feverish nights when he was one with the *ol* dead were too vague to be helpful.

"It's possible," he told himself, "that the *olz* never have gone—and therefore won't go—farther from home than the next village. It's also possible that they've never been involved in a project that required more workers than the population of their own village. They'd think they were no longer needed the moment I asked another village to join me."

Either way, the movements of the mighty army he had envisioned were likely to be somewhat limited: his soldiers refused to leave home.

He could not sleep. His *gril* was crushing grain kernels with its horny lips, adding a crunching sound to the rattling of the *zrilm* leaves, and Farrari's mind kept contending with the silly notion of overwhelming a

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militarily talented people with sheer numbers of clods who had never handled a weapon.

He needed help. A handful of IPR agents, or even one, could have kept the *olz* marching, but if he were so rash as to apply for assistance Jorrul would orate three pages of regulations to demonstrate that what he wanted to do was either impossible or forbidden.

He sat up suddenly. Distance, or the number of *olz* involved, had nothing to do with it. He had asked the *olz* to do something totally outside their experience: travel, with no accompanying work. If they carried their dead long distances, it was because there was labor to perform: transporting the bodies.

All he needed was a job of work for them to do on the march. "Something to carry," he mused. "Weapons would be ideal—it'd give them labor to perform and at the same time make it look as though they were revolting. But where would I find enough weapons for an army of *olz*?" He didn't even have non-weapons for them to carry.

Then he remembered his grain bags.

After five nights of frenzied activity he was ready to begin again. He led the *olz* of village number One to a cache of grain bags and distributed them, an armful to each adult *ol*. They marched into the night. At the next village he redistributed the bags, did so again at the third and the fourth—in the straight lane he looked back at an unending procession of torches. Village Five, village Six, another cache of bags—through the night Farrari's army marched with slouching, dragging footsteps and grew village by village. At dawn a thousand *olz* were dutifully trailing after him and several *durrlz* were finding, to their consternation, that their work force had disappeared.

He brought his *gril* to a stop where the lane opened onto a *durrl's* headquarters and waved his *olz* forward, telling them to drink and eat. As they moved up the slope toward the buildings, the *durrl* appeared and for a moment stood staring down the slope.

Farrari jerked his *gril* behind the *zrilm*, cursing himself for his monumental stupidity. *If a word from a synthetic assistant* durrl *would set an army of* olz *in motion, a word from a genuine* durrl *would certainly send it home again.*

When next he looked, the *durrl*, his assistants, their families and servants, were fleeing in panic. As the *olz* advanced up the slope they disappeared down the far side, obviously running for their lives, and took refuge in a *zrilm* hedge. Farrari recovered his composure and opened the grain and tuber stores and set the *olz* to raiding the *durrl's* stocks of *quarm*. Soon the circle of buildings was filled with *ol* fires, everything Farrari could find in house or barn that could serve as a cooking utensil was in use, and the *olz* were gathered

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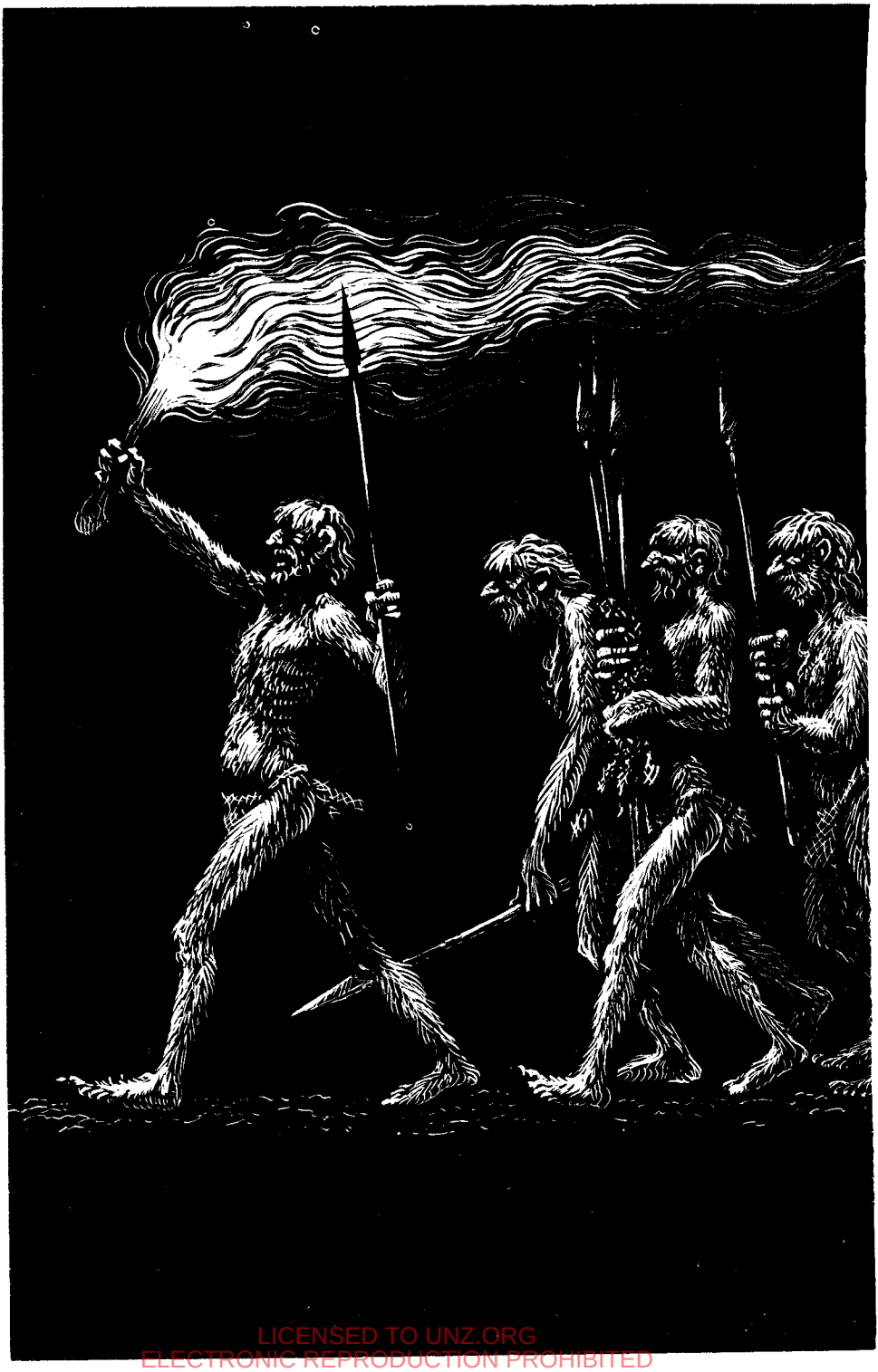

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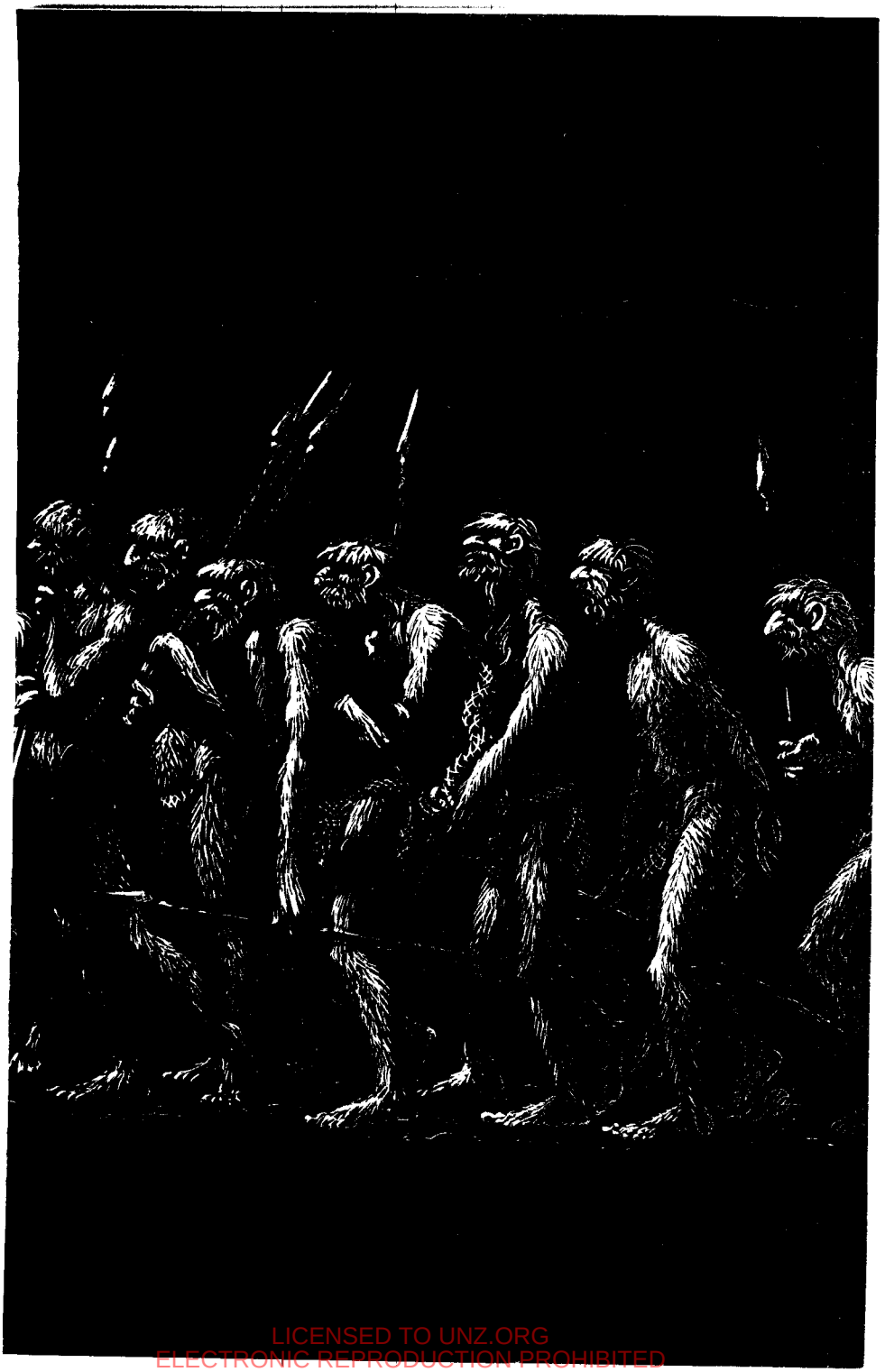

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in mute circles waiting for their food. Farrari kept a wary eye on the *zrilm* where the *rascz* had disappeared. After a time they realized that there was no pursuit, and they emerged from hiding and hurried away.

Farrari rushed the *olz* through their meal, and before moving on he issued rations to them: a tuber and a measure of grain for each *ol*. There would be other *durrl* headquarters to raid, but this gave the *olz* something to carry in their grain bags.

The march resumed, with Farrari climbing stiles to recruit *olz* who were at work in the fields, and instead of avoiding the *durrlz* he began to seek them out—but every headquarters was deserted. The first fugitives must have sounded the alarm, and word of the marching *olz* had spread with a swiftness Farrari hesitated to believe.

At dusk they reached the highway, and Farrari left his swollen army resting around nightfires and sent his *gril* scampering east. At dawn he was back with another, smaller group of *olz*, and while they rested and ate he marched the first *olz* onto the highway and turned them south.

He could not have imagined a shoddier-looking army. It slouched forward, a motley, unarmed crowd lacking even the demented sense of purpose that chacterized a mob. The second group followed the first, and in the wake of both came a straggling tail of enfeebled sick, young children, and women carrying children, and these Farrari halted where the highway crossed a rippling stream of clear water. He left them in the shade of a *zrilm* hedge to await the return of the others. Then he rode along the marching column, grunting orders to keep the *olz* moving.

They met no traffic, nor did any overtake them. For some reason Farrari never expected to understand, the *rascz* saw his farcical army as a sinuous monster flowing with irresistible force, and they had carried the warning in all directions.

At midafternoon they reached the deserted granary. Farrari attacked the huge grain crocks with a thick piece of *quarm*, and as each shattered, the lustrous, red-tinted grain gushed forth. A word and a gesture from Farrari, and the *olz* began filling their bags. As each *ol* emerged, Farrari spoke two words. "Home! Quickly!" The *olz* had only one speed, but impressed with the need for haste they would at least keep moving tirelessly.

Darkness fell. *Olz* stood by with torches, and at regular intervals Farrari dispatched one to light the way for the *olz* with full grain bags. "Home! Quickly!" Finally most of them were gone. Stragglers kept arriving, but Farrari left them to figure out for themselves what they were to do.

After formulating so many unsuccessful experiments, he could not believe that this one had worked. It seemed utterly unreal to him, it never happened, but the depot su-

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pervisor would have only shattered crocks to show for a vast quantity of vanished grain and on the highway the torches were marching north. It would be morning before the first word of the uprising could reach anyone capable of dealing with it, two additional days before the army could arrive, and long before then the *olz* would be peacefully at work in their fields or wandering about hopelessly lost. In either case the *rascz* would be befuddled, a lengthy investigation would be required, and with any luck at all a portion of the *kru's* army would be occupied indefinitely. As a bonus, the *olz* in the lower *hilngol* would eat well that summer and might even have a reserve of grain for winter. It was, Farrari told himself, a most successful beginning.

He filled his own grain bags, strapped them to his extra *grilz*, and took the south fork of the highway.

At dawn he changed mounts and rode at top speed until he sensed that his *gril* was tiring. Then he stopped to feed and water the *grilz* before he raced on. He still met no traffic, but he began to overtake refugees. He happened onto the first group unexpectedly as he topped a hill—a *durrl* and his dependents, the women and children in wagons with a few belongings, the men riding *grilz*. It was too late to turn aside, they had already seen him, so he swept past them and quickly left them far behind.

Later he passed other groups without arousing so much as a questioning look. To the fastidiously law-abiding *rascz,* the mere fact of a *durrl's* assistant racing along the highway with four *grilz* was proof enough of his right to do so.

A surge of wild exhilaration displaced his alarm. The *rascz* were fleeing from the *olz*! They seemed to be taking their time about it, as though they knew that even a *narmpf* could keep ahead of walking *olz*, and they obviously had the air of people going somewhere, rather than of running away from something, but even this sober afterthought could not diminish his satisfaction. The *rascz* were refugees!

On the second day he saw the highway ahead of him filled with the *kru's* cavalry. He turned aside and waited in the safety of a lane until the column had passed, not wanting to find out whether soldiers might have a more highly developed sense of curiosity than ordinary citizens. Later he met more cavalry, and on the following day he made a wide circle to avoid the garrison town that was the refugees' objective.

He continued south, riding hard by day, alternating his *grilz*, walking them through the night, and avoiding the occasional town, until both he and the animals were exhausted. Somewhere off to the west the city of Scorv stood smugly atop its invulnerable hill, and he was impatient to get there. He snapped the harness and urged his *gril* to greater speed.

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In the remote southeastern corner of the *lilorr* he began again. He stole grain bags and cached them, and when he had enough he pronounced the magic word, "Come!" and led an entire village of *olz* from the nightfire. And another. And another. At dawn he separated the young, the sickly, and women with young children and turned them back, because this army had much farther to go. He got the *olz* onto the highway and headed north, and he ranged widely both day and night, recruiting *olz* and searching out deserted *durrl* headquarters to plunder for food and grain bags. He exchanged his worn-out *grilz* for *grilz* the *durrlz* had abandoned in their sudden flight. He saw no *durrlz*, no *rascz*. Again the alarm had spread instantaneously on the first glimpse of the massed *olz*.

He began to experiment. He selected an *ol* of unusually large stature, positioned him at the head of the column each morning, and had him make the gesture of movement and call out, "Come!" By the third morning Farrari was no longer needed to get the march started.

At night Farrari scattered his *olz* among the local *ol* villages, marching a delegation to rob the local *durrl* of the necessary food. The crowds were so huge around the nightfires that sometimes the cooking pot was emptied and refilled all through the night.

And at dawn the chosen leader would take his place in the highway, gesture, mouth a word, and the march would recommence. On the seventh morning Farrari watched the *olz* out of sight, and then he left them. He traveled south until he reached an east-west highway, and then he raced west at top speed.

Toward the river.

Again he traveled day and night, and this time he met no one, overtook no one. The highway ended in sight of the immensely broad, swift river. He could not coax the *grilz* into the water, so after securing a piece of *quarm* log from the nearest *ol* village he turned them loose, made a bundle of his clothing, and as soon as darkness fell he pushed the log into the water. Choosing a pattern of stars to steer by, he struck out for the opposite shore. Grueling hours later he landed far downstream. He rested the next day, stole a *gril* and a bundle of grain bags the following night, and after a day of reconnoitering he appeared at an *ol* nightfire. "Come!"

Now he singled out only the most able looking males. The next morning, when he reached a north-south highway, he had a mere hundred *olz* following him, but they were the best looking *olz* he had ever seen. He appointed a leader and got the column started.

Toward Scorv.

XVIII

Farrari watched his army's progress with tortuous uncertainty. At

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some moment before it reached Scorv, this swelling crowd of passive, plodding slaves had to become one of two things: a genuine army with weapons, or an enraged mob that could carry all before it with the sheer weight of its fury and numbers. He would hide in the *zrilm* and watch the *olz* shuffle past, desperately searching each face. He needed a spark, or the magic word that would produce a spark. "How do you make a man hate?" he mused.

They slouched along the highway with the same awkward, shuffling walk they had used for more generations than any IPR historian had been able to count, and they could not be hurried. They held the long grain bags clumsily in front of them. Once Farrari halted the column and took the trouble to place each *ol's* bag over his shoulder, and the following day the bags again were carried in front of them.

The march was taking them farther from home than they had ever been. If they thought of this, if they speculated at all as to why they were marching, their faces revealed none of it—nor anything else. They had been told to march; they marched.

Farrari needed a spark.

He began to collect all the weapons he could find, but he wrapped them in cloth, making untidy, unrecognizable bundles of them, before he gave them to the *olz* to carry. A *rasc* seeing a spear-bearing *ol* wouldn't wait to find out whether or not the *ol* could throw it—and the *olz* could not or would not throw spears.

They did not need to become skilled. A thousand *olz* throwing blindly from behind a *zrilm* hedge could decimate a squadron of a hundred *rascz* trapped in a lane. But though the *olz* would hold a spear, carry a spear, or drop a spear on command, they would not throw it.

Even a distant rumor of marching *olz* continued to put the *durrlz* to flight, so they met no traffic and Farrari never saw a *rasc*. While his *olz* marched obediently behind their appointed leaders, he ranged far on either side of the highway, scouting out abandoned *durrl* headquarters to raid for supplies, and selecting recruits from *olz* at work in the fields they passed. His *olz* paid no attention to him at all, because none of them dared look at an assistant *durrl*, and so it was that when he found an *ol* not only looking at him, but even following him about, he was instantly aware of it. Amused, he circled behind the *ol* and asked, "Are you lost?"

"Yes," Peter Jorrul muttered. "Completely lost. I can't begin to figure out what's going on."

"You're the most unlikely *ol* I've ever seen," Farrari told him. "All your muscles are in the wrong places."

"I had to see this for myself. Liano told us you were dead, and then—"

"*Liano?* Where is she?"

"At base. She came to my headquarters and asked to be sent back."

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"You mean she said I was dead?"

Jorrul nodded.

"How is she?"

"Well. Normal."

"What do you mean by 'normal'?"

"Normal means normal," Jorrul said dryly. "She seems to have lost her clairvoyancy. Know anything about that?"

"I know she lost it just in time. Is she—happy?"

A smile touched Jorrul's lips. "She may be when she hears that you're alive." He paused and then said sternly, "Just what are you trying to do?"

"Free the *olz*," Farrari said. "Haven't you noticed?"

"I told base that if you really were involved in this we'd find a new record for regulations broken in one operation, with maybe our mission completely ruined and the planet blown as a bonus. Thus far I haven't seen a single false step. The *olz* seem to be doing this all by themselves. I haven't heard you give a single order, and yet the *olz* are marching on Scorv. How did you manage it?"

"You heard what Liano said. I died."

"Listen, Farrari. This is a serious matter. We have to know—" He broke off as Farrari opened his cloak, exposing the puncture scars.

"I died," Farrari said. "Not only that, but I just missed being thrown to the Holy Ancestors, which would have killed me a second time. I'm the only *ol* on Branoff IV with the distinction of having returned from the dead, and I thought I could make something of that, but it didn't work out. I don't manage things, I just blunder into them."

"You've managed the impossible," Jorrul said firmly. "You've not only done it with skill, but as far as I can tell you haven't done a thing that will get any of us demoted. What are you trying to accomplish with it?"

"Free the *olz*," Farrari said again. Awake a slumbering giant and make of it a raging instrument of revenge. Extract payment in kind for the horrors mercilessly inflicted upon a defenseless, subservient race. If he could find a spark, the *olz* would be masters of Scorvif by the end of summer.

"The *olz* around here seem free enough right now," Jorrul said. "What about that fuss in the lower *hilngol*? Who managed that?"

"I did."

Jorrul looked at him doubtfully. "Who's managing the disturbance across the river?"

"The *olz*," Farrari said. "I started it, but they're managing it by themselves if it's still going on. Is it?"

"We haven't been able to find out what's going on there. The *olz* seem to have vanished, and the *kru's* army is churning up the eastern *lilorr* in a major campaign against nothing. What happens after you've freed the *olz*?"

Farrari did not answer.

"Do you know what you're doing and where this thing is headed?"

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"Of course!" Farrari said angrily.

"I hope so. A revolution is like the water in a reservoir. Before you smash whatever is holding it there, it's wise to perform the necessary engineering to find out where it will go. Because if you later discover that you've made a mistake, you can't put the water back. And once one really gets started, you can't, ever, put a revolution back. I have to report to base. It'll take me a couple of days because we're that far from where I left my com equipment. Being an *ol* agent has certain disadvantages—there's a limit to what one can conceal in a loincloth. Want me to ask base for anything?"

"Would base give it to me?"

"I'm going to recommend that you be appointed field team commander," Jorrul said soberly. "You started this revolution yourself, and you're the only one who understands it and knows where it's going and what the potential is. You should have full authority over all IPR personnel and every available resource. Any orders?"

"How many agents did you bring with you?"

"Every agent we could pry loose has been assigned to the three areas of *ol* disturbances."

"Then you aren't the only strange-looking *ol* in my army. Get them out of here—recall all of them. The *olz* are doing this by themselves. I also want you to recall your *rasc* agents. I've seen a lot of dead *olz*. I expect to see some dead *rascz*."

"Our agents will take the risk. That's their job."

"Then the responsibility is yours. I don't want to command the field team. I just want it to stay out of my way."

"Do you mean you don't even want a liaison?"

"You thought I'd blown the planet," Farrari said bitterly. "Let me tell you something. This planet was blown the day IPR landed. The *olz* are *wise*. They neither know nor care what an IPR agent really is, but they know he's no *ol*. So get your agents out of here. Stay yourself and be my liaison if you want to, but not as an *ol*. You'll be more useful as an assistant *durrl*."

Jorrul nodded enthusiastically. "No walking. And I can carry my com equipment with me."

"Do that," Farrari said. "And ask base to maintain a continuous surveillance on the *kru's* army."

"We do that anyway as well as we're able. Agents report everything they see, but agents aren't always in the right places. When there's unusual activity we order night flights, but there's a limit to what one can see from the air at night. Right now we know that large forces are still puttering around the lower *hilngol* and the southeastern *lilorr*. Maybe you know what they're looking for."

"I know they won't find it. Those actions were diversions, to tie up as much of the *kru's* army as possible so there wouldn't be anything left to defend Scorv."

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Peter Jorrul murmured: "I see."

"My own notion of military tactics," Farrari said lightly. "The best way to defeat a superior foe is to attack when he isn't there."

Jorrul looked at him sharply. "That's a fine idea, but it needs a preliminary reconnaissance and a thorough understanding of the opponent. The *kru's* generals aren't about to rush their central reserve across the river until they're certain that there's no threat elsewhere. It's the local garrisons that are dealing with your diversions. You didn't pull a single soldier away from Scorv."

Farrari shrugged. "So I'm no military tactician."

"I hope you are," Jorrul said, "because most of the central reserve is headed south right now. The generals are taking their time about it, and they're sending reconnaissance missions all over the western *lilorr*, but they're coming. At the rate both of you are traveling, you'll have five or six days to get ready for them."

Jorrul returned outfitted as an assistant *durrl*, and Farrari found his own labor cut in half. Jorrul ranged one side of the road and he the other, scouting and recruiting. To expand his army quickly, Farrari began taking every male *ol*. He had made the interesting discovery that his *olz* actually improved in health. Their plodding pace prohibited strenuous marches, and they were eating better on the stolen *durrl* stores than they ever had in their lives while doing very little work.

He possessed increasing amounts of time in which to worry. By way of Jorrul's com equipment he arranged a private conference with Liano. "What motivates the *olz*?" he asked her. "What would make them angry?"

He pleaded, but she did not answer.

Jorrul saw the huge army of patiently plodding *olz* as an irresistible force and feared that it might escape Farrari's control. He was not aware that this revolution could be turned off, put back, merely by telling the *olz* to go home. On the other hand, an ignited and aroused *olz* might be very dangerous indeed, but Farrari had to find his spark quickly and damn the consequences.

He asked Jorrul, "What's happening in Scorv?"

"Nothing much. Lots of refugees have been checking in with relatives there, every *rasc* in this country has at least one family of relatives in Scorv. But there's no alarm, or shortage of supplies, or anything like that."

"How much food does the city keep on hand?"

"No idea."

"I was wondering how long it could hold out under a siege."

"I don't know," Jorrul said. "Most of its food reserves are in depots a long way from the city or on the hoof being driven there. On the other hand, the length of time a city holds out under siege depends as

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much on the character and determination of the people as on their supplies. The *rascz* make fine soldiers, but as far as I know the people have never been tested. You're thinking of laying siege to Scorv?"

Farrari smiled wistfully. His *olz* had never been tested, either. "Any new word on the *rasc* army?"

Jorrul shook his head. "As of right now, we haven't a single agent between here and Scorv who's in position to observe. Our agents have to behave normally, and when the *rascz* headed for Scorv they went with them. Base has platforms out every night, but they literally aren't catching a glimmer--which means that the army is moving at night or doing without fires. All we know for certain is that it hasn't returned to Scorv, so it's either advancing or waiting for you. Don't you think you ought to start getting ready for it?"

It was the moment when Farrari should have sent the *olz* home. A trained army was sweeping toward them, they were utterly defenseless, and this time their blood would be on his hands. But he had come so far, he had accomplished half of a genuine miracle, and he could not bring himself to turn back--not when he could accomplish the whole miracle as soon as he found a spark.

And the *kru's* army did not come. Each morning Jorrul checked with base, each morning base had nothing to report, and day after day Farrari and Jorrul recruited more *olz* and moved ever closer to Scorv, until one morning Farrari scouted far ahead of the *olz* and found himself standing at the edge of the wasteland. No intoxicant had ever exhilarated him as did the bleak view he drank in that bright morning from a low hill south of Scorv: The city lay just beyond the horizon, and there was no sign of a *rasc* army to bar the way.

He hurried back to tell Jorrul what he had seen. Jorrul said slowly, "I suppose it's possible that the army took one look at the *olz* and ran. That doesn't make sense to me, especially since the army doesn't seem to have run anywhere, but it also doesn't make sense to me that the *durrlz* would take one look at the *olz* and run. How much about this revolution does make sense?"

"We'll be starting across the wasteland day after tomorrow," Farrari said. "The *olz* will have to take all the food they can carry. And *quarm*."

"You're still farther from Scorv than you realize," Jorrul said. "The wasteland is wider here than in the north. Fortunately there's a food storage depot halfway across it, and the depot is an IPR base with a communications room. Two of our agents are still there. I'll ask them what they have on hand."

They had huge stores of grain, ample *quarm*, and very few tubers, so Farrari and Jorrul separated to search out *durrl* headquarters with large stocks of tubers. It was nearly

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dusk when Farrari returned to the highway. A short distance to the south he saw the endless mass of *olz* moving toward him, and he decided to dismiss them for the night when they reached him. He dismounted and led his *gril* to the side of the road to wait. The *olz* plodded forward as they had on every other day, stolid, indifferent to the loom of history just beyond their grasp, sparkless.

Farrari needed a spark.

Suddenly color flashed as a pair of cavalrymen burst from a lane—and another pair, and another, a full troop mounted on spirited *grilz*, spears poised for throwing. They bore down on the column of *olz*, and the *olz* halted, pressed to one side to make room for them, and stood with eyes lowered.

Farrari leaped to his feet and watched helplessly. The cavalrymen thundered alongside the *olz*, turned abruptly, and disappeared into another lane. The *olz* calmly resumed their march. A moment later another troop crossed the highway at top speed, brushing *olz* aside and sending them sprawling.

Farrari mounted his *gril*, urged it forward a few steps, and then halted uncertainly. He could no more protect his *olz* from the *kru's* army than he could keep the sun from setting. They were doomed, and having led them to their death, the least he could do was to die with them.

As he started forward again, a shout rang out behind him. A third column of cavalry was crossing the highway, and one of the riders had seen Farrari. The troop swerved and raced toward him. Farrari hesitated; he was only an assistant *durrl* fleeing from the rapacious *olz*, and there was no reason for his fellow *rascz* to molest him.

A spear thrown at long range clunked onto the paving just behind him, and a second spear whistled past him as he snapped the halter and sent his *gril* sprinting into a lane. He jerked it aside at the first cross-lane, slipped to the ground, and rolled toward the *zrilm*, leaving the *gril* to scamper on without him. He barely had time to conceal himself before the troopers sped past. As soon as they disappeared he stripped off his *rasc* clothing and stepped forth clad only in an *ol* loincloth. He would die with the *olz*, but as an *ol*. He hurried back to the highway.

The column of *olz* still plodded toward him, stolid, indifferent, unaware of the threat of death that had flashed briefly and then turned aside. "They want to die," Farrari muttered. It was a piece of the puzzle that he had somehow mislaid. It seemed that he could not take up a new idea without losing track of an old one. What was this most recent thing he had been looking for? A spark?

He watched the *olz* disbelievingly until they reached him, and then he stepped forward, waved an arm in the manner of an *ol* sent as messenger, and sounded the dismissal word.

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The *olz* scattered; they would faithfully return to the highway at dawn.

Farrari walked back along the dispersing column, suddenly very worried about Jorrul. The warm summer darkness of Branoff IV came upon him quickly; the *rascz* seemed to have disappeared, so at the first *ol* village he collected *olz* with torches and began a search. Halfway through the night and an eternity later they found Jorrul's dead *gril*. Jorrul lay pinned under it, a spear through his side, a leg and an arm broken, delirious, unable to move, but alive.

Farrari administered rudimentary first aid and then dismissed the *olz* so he could use Jorrul's com equipment. A short time later a platform arrived from field team headquarters at Enis Holt's mill, and Jorrul was gently lifted aboard.

Just as the platform was taking off he opened his eyes and asked weakly, "How are the *olz*?"

"All right," Farrari said.

"You mean—they won?"

"A tremendous victory," Farrari said gravely.

"That's wonderful! How many casualties?"

"One," Farrari said. "You."

The platform drifted into the night. Farrari wrapped the com equipment in rags and carried it with him. He rested for an hour, and then he visited *ol* villages as a messenger to send his army to loot the tuber stocks of nearby *durrl's* headquarters. At dawn, when the *olz* again assembled on the highway, Farrari stood like a coward watching them march off toward Scorv.

At the same time, he wondered: since there had been no attack, perhaps the *olz* had won a victory.

The cavalry returned. Throughout the day the march was halted repeatedly while mounted troops crossed the highway or rode beside the column of *olz*. Farrari marched as an *ol* near the head of the column, and each time the *rascz* appeared he braced himself for an onslaught. Nothing happened except that he ended the day in a state of prostration. He dismissed the *olz* as usual and climbed under a *zrilm* bush for a badly needed sleep. Toward morning he awoke and contacted base; Jorrul had arrived there and would recover, and he'd asked that Farrari be thanked for taking the trouble to find him. Farrari swore bitterly and cut off.

The following day the *olz* headed out across the wasteland. Farrari scanned the horizon nervously, for this could have been the moment the cavalry waited for, when the *olz* did not have a vast complex of *zrilm* hedges as potential cover, but on this day the soldiers did not appear at all. It worried him much less that the *olz* might not have enough food to last until they reached the depot, for what were a day or two without food to an *ol*? Not until nightfall did he remember that they had no cooking utensils and were now far from the

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cooking pots of the nearest *ol* villages. While he was wondering what to do, the *olz* moved to low ground near the river, dug large holes in the sticky clay, and filled them with water. Then they pushed heated stones into the holes, and the water boiled.

On the third day they reached the storage depot. Again Farrari appeared in the guise of his own messenger, and the *olz* spilled over the wasted landscape and settled themselves to wait for further orders. Farrari went to investigate a clamorous wailing that eminated from an outbuilding, and there he found two *narmpfz* left without food or water. He watered and fed them, and then he found his way to the underground communications room, where he spoke harshly to the two young agents there about allowing the unfortunate *narmpfz* to starve.

They shrugged; their superiors, the granary supervisor and his wife, had fled to Scorv with the *rascz* when word came of the approaching *olz*. Naturally they had to do the normal thing, and if it were also normal that the animals the *rascz* left behind them starved, then the granary supervisor's would have to starve, too, or people might be suspicious.

"Show me the granary," Farrari said disgustedly.

They climbed a series of ramps to the roof, and Farrari's first concern was not the blur on the northern horizon that was Scorv, but the opposite direction, where the *kru's* army might be following closely. He saw no *rascz*, but that relieved his worries not at all. Whenever the soldiers tired of playing whatever game they were playing, a company or two could liquidate all of the *olz* in a single afternoon. The *olz* would stand with bowed heads allowing themselves to be slaughtered.

He said to the IPR agents, "How do you make a soldier out of someone who wants to die?"

"He should make the best kind of soldier," one of the agents said.

Farrari muttered, "Wanted: one spark."

The agents were staring down at Farrari's army as though realizing for the first time how many *olz* there were in Scorvif. "Going to storm the city?" one of them asked.

Farrari did not answer. If he led the *olz* to the foot of Scorv and handed each a tuber—which was as effective a weapon as any in the hands of an *ol*—and told them, "Come!" they would follow him to the center of the city and pile their tubers at the door of the Life Temple if no one stopped them, but they wouldn't make a threatening gesture at any *rasc* they met along the way.

"Going to try to starve out the city before the army returns?"

Again Farrari did not answer. For all he knew the army was less than a day away, and even if it were not the sparkless *olz* were incapable of keeping even one wagonload of food from reaching Scorv.

"Jorrul sent a message for you," one of the agents said. Farrari nodded.

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"He said to remind you that a revolution isn't a plaything. He thinks maybe you're having such a good time with this one you've forgotten your objective. He says to tell you that the *rascz* can't survive without the *olz*—they wouldn't know how to begin to raise a crop. The *olz* can survive without the *rascz*, but only as an unorganized, barbarian society of peasants, and that only until another strong nomadic race enslaves them again. If either is destroyed, you'll doom civilization on this planet."

"The *olz*," Farrari said angrily, "had a high civilization before the *rascz* came here. They built the old city of Scorv—those massive old buildings and also the Tower-of-a-Thousand-Eyes. This civilization didn't originate with the *rascz*, and it won't end with them."

The agents stared at him. "The *olz* . . . built . . . can you prove that?"

"Certainly."

"*Wow!* Why doesn't anyone else know about it?"

Suddenly Farrari wondered if it mattered. It had been a long time since the *olz* built anything more complicated than huts. How much could they remember, and how long would it take them to relearn skills their race hadn't used for uncounted generations? And if they could remember, could relearn—would they want to?

He kept forgetting something he'd learned so long ago: the *olz* wanted to die.

He stepped to the north parapet and looked toward Scorv, where a serious, decent, creative, hard-working people calmly harbored their refugees and waited—for Cultural Survey AT/1 Cedd Farrari to find the spark that would destroy them? "I've been out of my mind, or I would have turned back," he said softly. "I caught Bran's disease. I wanted to annihilate the *rascz* because they killed me, even if I had to annihilate the *olz* to do it."

An agent said bewilderedly, "How's that?"

"They aren't monsters," Farrari murmured.

"The *rascz*? Of course not! Whoever said they were?"

Farrari turned and slowly descended the ramps to the underground communications room. "Get me the coordinator," he said.

A few minutes later he faced Coordinator Paul's familiar grin. "Well, Farrari? It's been a long time."

"We'd better have a meeting," Farrari said. "All the specialists who know anything that touches on this revolution of mine. Can you get me back to base tonight?"

"Of course."

"What it amounts to," Coordinator Paul said kindly, "is that you've worked a miracle to no purpose. You've created a revolution without a cause."

Farrari wrenched his gaze away from Liano. "Half a miracle," he said. "And I didn't realize what an

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evil half miracle it was until I stood there on the depot roof and looked at Scorv. As someone pointed out to me a long time ago, the average *rasc* has never seen an *ol*. Even if I could somehow transform the *olz* into a real army, they'd gain their freedom only by destroying a good and creative race of people. So now I don't know what to do."

"Revolution without a cause," the coordinator said again, savoring the phrase. "Except that it's not really a revolution. You hand your *ol* something to carry and say, "March!" and when you have enough *olz* marching you have the illusion of an army--until the moment comes when it has to fight."

Farrari nodded glumly. "As far as I can figure out, the *olz* want to do only two things: worship the *rascz*, and die."

"It would seem so," the coordinator mused, "and yet—when the *olz* march as a group, *durrlz* flee from them and soldiers ride past them fearing to arouse them with a threatening gesture. Strange. The *olz* who built the old city of Scorv must have been mighty warriors to have their utterly servile descendants inspire such fear. Your revolution may be a failure, Farrari, but you've given this staff enough study material to last it for years if it can survive the shock of an *ol* revolt."

"All I want to do now is get the *olz* out of this safely," Farrari said. "If they simply turn around and head for home, what will the *rascz* do?"

The coordinator looked about the table, inviting comment, and each specialist seemed interested only in deciphering his notes. Liano was finding the far wall fascinating, and she continued to avoid Farrari's eyes. Peter Jorrul, sitting in a motor chair at the side of the room, looked at Farrari.

"*Until* they get home, I don't know," the coordinator said. "*After* they get home, it will depend on the individual *durrl*. Some may treat their *olz* better; others, when they get over being frightened, are likely to be extremely angry. I'm afraid there's nothing that can be done about it."

"The problem," Farrari said, "is that IPR has no one in a position to influence *Rasczian* thinking."

"That's one of the problems," the coordinator said, smiling wistfully. "It's been noticed before. In fact, my predecessor left me a memo about it."

Jorrul leaned forward and thumped the side of his chair with his uninjured arm. "If Farrari had stayed there as *kru's* priest—"

"No," the coordinator interrupted firmly. "In that case there would have been no illusory uprising about which *Rasczian* thinking would need to be influenced."

"But he can go back now!" Jorrul said excitedly. "Have Dr. Garnt restore his pretty face, dress him in the proper robes, and put him down at the city gate. Everyone will recognize him—his portrait is on display at the

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temple and in the palace and in half a dozen public places. And because he was a miracle, they never appointed a successor. They'll think his reappearance is due to the *ol* crisis, and he speaks enough *Rasczian* now to walk right in and take over the country."

"Impossible," the coordinator said. "That would amount to a permanent assignment. After Farrari's disappearance, headquarters issued a regulation. No permanent assignments to CS men, temporary assignments only in the direct furtherance of their cultural studies. It saves you from a dubious honor, Farrari. On the *kru's* death—and His Present Dissipated Majesty won't last much longer—his priest becomes a Custodian of the Eyes and dedicates the remainder of his life to the care of the tomb of his lamented master. It amounts to imprisonment."

"I'll risk it gladly," Farrari said, "if there's a chance of bringing about permanent changes in the condition of the *olz*."

The coordinator shook his head. "Permanence is a highly elusive thing."

"What could I do that would have a shock effect that the *rascz* will never forget?"

"You couldn't find a spark for your *olz*," Jorrul grumbled. "Now you're trying to find a shock for the *rascz*. I don't believe in shocks and sparks."

"I'd like to see those carvings of the *kru's* priest," Farrari said. "Do you have teloids?"

The coordinator sent for the teloids, and Jorrul rode away to confer with Isa Graan about reproducing the robes of a *kru's* priest. Farrari snapped the cubes into a projector and studied the projections: a full-faced carving showing him standing meditatively behind the *kru's* throne; two side views; and a dramatic representation of the moment when he had deftly bisected the alleged loaf of bread. He called for a mirror, and while the others looked on perplexedly he compared his *ol* countenance with the faces in the carvings.

Jorrul returned, saw what he was doing, and said sarcastically, "You're lucky. When the doctor restores your face, he'll have a first-rate portrait to copy—and the *rasc* artists aren't quite the realists I'd thought. They improved your looks considerably."

"I think I can make it do," Farrari said finally. "In the proper setting the resemblance should be obvious."

"What are you talking about?" Jorrul demanded.

"Impact," Farrari said. "Influencing *Rasczian* thinking. The shock and the spark."

"Graan thinks he can duplicate the robes externally, but you'll have to be careful who's around when you take them off. There's no possible way of finding out what they're lined with. I told him to get started."

"Tell him to get unstarted. I don't want his robes."

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Jorrul thought for a moment. "You may have a point. No one knows what happened to the robes you left there. They probably enshrined them. It might be more effective if you wore the same apprentice costume you wore before and let them furnish the robes."

"No."

"We can discuss it later. The important thing now is to get Garnt started on your face."

"I like my face the way it is."

"What *are* you going to do?"

"Just what you suggested. Present myself at the city gate and save the *rascz* from a catastrophe they don't know they have."

"*As an* ol?"

"Right."

"You're insane!"

The coordinator was watching Farrari. "Will you need anything?"

"Some *ol* agents to help with my army. The timing is going to be delicate."

"I meant--will you need anything in the way of special equipment?"

"It isn't exactly special equipment," Farrari said, "but I'd like to have a loaf of bread."

XIX

Farrari awoke at dawn and for a moment could not remember where he was. The cool, dry sand trickled between his toes when he moved them. Above him, one of the enormous paving stones protruded over the edge of the washout. He stirred lazily and eased himself to the top for a glance at Scorv's looming hilltop. Then he descended, made himself comfortable, and went back to sleep.

The sun was high in the sky when he awoke again. He slid to the bottom of the washout where a pool of clear rainwater stood, undisturbed by traffic since it had fallen. He drank deeply, and then he paused for a moment to choose the path that would get him onto the highway with the most speed and least effort--so that if sentries were watching from Scorv, Farrari would seem to appear miraculously.

He picked up his package, scrambled up the soft, caving side of the washout, and headed for Scorv. His stride was the swaying shuffle of an *ol*, and his package lay on his outstretched hands: a loaf of bread wrapped in a white cloth on which several black crests of the *kru* had been drawn meticulously. It would be the most trivial of gifts, this loaf of bread for the exalted *kru*, but it came from an extraordinary, an impossible donor--if Farrari lived to make the presentation.

He moved along at his slouching pace, his eyes downcast and fixed on the road ahead of him. He soon began to perspire--an un-*ol*-like trait--and when the road detoured around another washout, which had left a low, swampy area, a cloud of biting insects pursued him and soon had him twitching miserably. An *ol* would not have noticed them.

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"But I'm the best non-*ol* available," he told himself grimly.

An *ol* walking that road on that day should have cast a gigantic shadow, but no one came from the city to investigate, no one met him. As he passed the cluster of buildings at the foot of the hill, willing himself not to look toward Borgley's bakery, he had the strange feeling of having stepped backward in time to another incarnation when he had also walked this road with a gift for the *kru*. Everything looked the same. There was not even a guard or a sentry point at the threshold of the city—and an *ol* army was only hours away!

Even the *rascz* looked the same until they saw him. Then they stopped to stare, some hurried to doors to summon family and friends, others followed him a short distance in silent awe.

An *ol*. The first most of them had ever seen.

The road pointed upward, and Farrari began the wearisome climb to the hilltop. Four times along the encircling road he crossed temporary bridges of planks laid over wide gaps cut deeply into the rock. They were old defenses, he thought, packed with dirt and paved over until needed and then quickly excavated. It proved that someone knew the *olz* were coming, and a small force stationed directly above them could defend those gaps in the road against an army—if someone remembered to remove the planks.

He gained the top and started down the long, broad avenue toward the Tower-of-a-Thousand-Eyes. It was so precisely as he remembered it that he seemed to hear Gayne's voice: "Don't gawk!" He kept his head lowered and saw as much as he could, and the only thing that clashed with his memory was a glimpse, once, of a costume that he did not remember seeing in Scorv on his previous visit: a *durrl's*.

The avenue fell silent ahead of him, remained silent after he had passed. Those in the street backed away in astonishment; above his head shutters opened, faces peered down incredulously. He plodded on, the bread a leaden weight and his extended arms aching agonizingly, between lines of staring, astounded, speechless *rascz*: a scrawny, hairy, starved, almost naked specimen who bore scars of *Rasczian* authorship—their authorship—and who carried a gift for their *kru*. Farrari wondered if any of them would have the charity to think, as he had thought when he first saw a *rasc*, "He's not a monster!"

A troop of cavalrymen appeared from a side street, brushed through the crowd, and brought its *grilz* to a rearing, braying halt. The soldiers studied Farrari with a shock that deepened as they comprehended his mission, and finally they turned to provide him with an escort.

He reached the temple square. The cavalry swung to the left to pass around the Life Temple toward the palace, where the *kru* normally ac-

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cepted gifts. Farrari walked straight to the temple. He was determined to present this gift where he had presented the last, except that this time he intended to enter by the front door. He mounted a short flight of the strange, ramplike steps, crossed the broad terrace, and stood before the massive door. Eventually someone would tell the priests what was happening, they would confer and perhaps consult the *kru*, and a decision would be made.

In the meantime, Farrari would wait. And wait. There were circumstances, he thought, when a training in *ol* mentality had its advantages.

He waited.

Behind him his cavalry escort returned and drew up uncertainly. A growing murmur told him that the square was filling with people. Then he heard the sharp clicks of many hooves, a long line of cavalry swept through the square, his escort followed it, and the crowd faded away in an instant. He knew what had happened: the *ol* agents had timed the advance perfectly, and the *olz* had finally been sighted moving across the wasteland toward Scorv. The citizens had gone to see for themselves or headed for home and safety. Farrari had the temple square to himself.

The door opened.

He expected an underpriest or servant, but two high priests faced him. He stepped past them, walked the length of the empty room with them trailing after him uncertainly, mounted the ramp, executed a flawless bow, and laid the gift at the foot of the empty throne. Then he rose, pivoted slowly, and demanded in *Rasczian,* "Where is the *kru*?"

He had placed himself so that he stood in line with the relief carving behind the throne. For a suspenseful moment both priests stared blankly. Suddenly one recognized him and

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edged backward. Then the other started and turned, their eyes met for an instant, and they fled wildly. The *kru's* miraculous priest had returned!

As an *ol*!

Farrari had read somewhere that the measure of a man could be gauged by the way he faced a miracle. The priests' measurements were small indeed; the *kru's,* microscopic. He arrived preceded by an irruption of guards and priests, and he trailed an interminable, reluctant tail of nobility. For a long time he stood immobilized with fear at the foot of the ramp, staring up at Farrari while the jittery priests urged him forward. He had gained weight since Farrari had seen him, and the new lines in his pouting jowls had not been placed there by the burden of his high responsibilities. When finally he stirred, his ascension to the throne was a moving form of collapse.

With the high priests' assistance he got himself seated. Farrari again sank into his bow and then stood motionless while the *kru* fumbled with the gift, dropped it twice, and finally with shaking fingers got it open. He tried to pass the bread to one of the high priests, who did not want it. A lesser priest was summoned, and he edged forward, seized it, and fled.

Prompted by his priests, the *kru* made ostentatious throat noises and eventually produced a question. "What is your counsel?"

Farrari met his eyes boldly. "I have come to petition for a redress of your people's grievances," he announced in a booming voice that made the *kru* wince.

The *kru* nervously lowered his eyes. "My . . . people's . . . grievances?" he muttered.

Again Farrari boomed his words. He wanted as many witnesses as possible and no doubt whatsoever as to what he said. "Are not the *olz* your people, Excellency?"

"The . . . *olz* . . . my . . . people," the *kru* muttered. Then he started, jerked his head erect, and exclaimed incredulously, "The *OLZ* my people?" Farrari met his gaze sternly, and the *kru* lowered his eyes and muttered, "The *olz* my people. What is their grievance?"

"That Your Excellency is so badly served."

Again the *kru* jerked erect, but this time he was speechless.

Farrari was watching the high priests. Clearly it had been a long time since those wrinkled old men had taken advice from anyone, and probably they, too, had never seen an *ol;* but obviously they believed in their religion or they would not have taken fright at the manifestation of a miracle. They would listen carefully when the miracle spoke, and if they believed what he said they would have the power to act.

"Badly served," Farrari went on,

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"by deputies who cruelly abuse your people."

One of the priests leaned forward and asked, "Cruelly abuse—how?"

"By starvation, by the *zrilm* whip, by the spear." He touched his own scars. *Kru* and priests stared until Farrari stirred self-consciously and felt the scars begin to itch.

"What deputies?" the priest asked.

"Your soldiers, your *durrlz*—all who serve you with your people the *olz* serve you badly."

They continued to stare. Farrari waited anxiously for something to happen. There had to be a set formula for concluding an audience with the *kru*, but IPR had not known what it was. Farrari hoped that it would not apply when the petitioner was a miracle.

Finally he announced, "The *kru* redresses all just grievances." He paused. "*Redress these!*" he snapped. *Kru* and priests winced as though he had struck them. He bowed again, backed down the ramp, and turned away.

His last exit from this room had been through an eager, enthused crowd that pressed close to look, even to touch. Now all shrank from him. He marched to the door, waited until someone sprang to open it, and waited again until it crashed shut behind him before he resolutely began the long walk out of the city. The IPR specialists had told him that he would probably reach the temple unharmed, but they would make no prediction as to his return.

It was easier, because he no longer had the bread to carry. Again he was an object of curiosity, but there were few pedestrians about and no cavalry, and no one hindered him. He descended the hill, passed the suburb, and abruptly came upon the *kru's* army, rank upon rank of mounted soldiers drawn up on either side of the highway, silently awaiting battle. He passed through it, expecting a rain of spears at any moment, but the soldiers sat with spears poised and made no movement.

Spread out on a distant hillside were the *olz*. They looked like a formidable army until he approached, and then they looked like *olz*. A messenger, one of the IPR agents, had told them to halt, so they stood indifferently in the hot sun awaiting another order. Farrari worked his way among them to where one of the agents stood. The agent arched an eyebrow inquiringly; Farrari shrugged. Even had they been able to talk he would have had little to say. He had marched an army on Scorv, he had made a miraculous and dramatic reappearance before *kru* and priests and nobility, and he seemed to have accomplished nothing.

Now he did not know what to do. He was still reluctant to turn back while there remained a possibility that the *ol* presence might force the *rascz* to think, but if he waited too long there was every likelihood that the army would charge and very effectively resolve the stalemate. He

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did not know what to do. The agent, too, was puzzled. He looked about perplexedly, having just worked it out for himself that nothing was happening and they couldn't stay there forever.

They heard the clicking beat of *gril* hooves. It was a *durrl,* final proof, Farrari thought gloomily, that his plea had failed. Immediately he brightened, of course they'd send a *durrl,* who else could talk with the *olz*?

The *durrl* brought his *gril* to a halt. Farrari resigned himself to an interminable address in two languages because a blast of oratory concerning the *kru's* redressment of just grievances would not find enough words in *ol* to properly get started. He was also prepared to be amused.

The *durrl* leaned forward and said something. Abruptly the *olz* in the front rank turned, those behind them turned, and before Farrari could quite comprehend what had happened his army had done an about face and was marching away, he along with it. The *durrl* wheeled and rode toward Scorv without a backward glance. Farrari was sorely tempted to turn the *olz* toward Scorv again, but he feared that *rasc* patience might have a breaking point.

At dusk the IPR agents halted the march. Farrari left them in charge of his *olz* and continued south where a platform picked him up as soon as darkness fell. He was back at base before morning. Base already had the news, and Jorrul and the coordinator were seated in one of the conference rooms discussing it. They'd left word for Farrari to join them.

"The *rascz* know something we don't know," Jorrul announced bluntly.

"Or understand something we don't?" Farrari suggested.

Coordinator Paul nodded. "They've had considerable more experience with the *olz* than we have. You produced the illusion of a revolution, but evidently the *rascz* know that the *olz* won't revolt. When we study the events of the past few weeks, we'd best start by trying to understand that."

"*You* study the events of the past few weeks," Farrari said. "I'm going to revert to a Cultural Survey Advanced Trainee."

Jorrul snorted. "There's no future in that. If I've heard you say it once, I've heard it a dozen times: the *olz* have no culture."

Farrari got to his feet and strode to the observation window. The first light of dawn was touching the bleak mountain landscape. The mountains wore encircling mantles of dusky yellow *quarm* leaves, and there were, even in midsummer, snowcaps on the highest peaks. He wondered if IPR had chosen this particular location for some obscure psychological purpose: certainly the view was no more formidable than IPR's problem on Branoff IV.

"The *olz* have no culture," Farrari repeated slowly. "If I've said it that

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many times, I should have given some thought to what it meant."

"Just what do you mean by that?"

"The *olz* have no culture. Neither do the *grilz* nor the *narmpfz*."

"So? *Grilz* and *narmpfz* are animals. You're expecting animals to produce a culture?"

"No," Farrari said. "But *people* should."

XX

The history section appropriated all the teloid projectors not in use, set up batteries of them wherever space permitted, and operated them continuously with changing shifts of carefully briefed volunteers. As section chief Wally Hargo remarked, IPR had been on Branoff IV long enough to take a lot of teloids.

"Any progress?" Farrari asked him.

Hargo shook his head. "There's no way to speed up a teloid projection, and we wouldn't if we could. Whatever we're looking for is going to be hard to find even if it's there, which it probably won't be."

Peter Jorrul hobbled in using a cane and thundered, "Which one of you miscreants stole my teloid projector?"

"Hargo," Farrari said. "But you can use it any time you like if you don't mind looking at his teloids."

"It isn't enough that this place is infested with super-specialists," Jorrul grumbled. "You two have to run a super-teloid production."

"You're looking fine," Farrari told him. "All you needed was a few weeks away from base."

"Away from the *food* at base. I can't let myself be seen, no *rasc* walks with a cane, but at least at my headquarters I can *eat*. What are you two looking for?"

"Insurrections," Farrari said.

"In the plural? In Scorvif?"

Farrari nodded.

"No wonder you need so many projectors. There haven't been any."

"But there have, only the records aren't easy to come by because they aren't the sort of thing the rulers of Scorvif would want commemorated. Others might get the same idea. We don't expect to find relief carvings, for example, depicting the glorious victory of the *kru* Vilif over the crass insurrectionists."

"You don't expect to find it, but you're looking for it anyway?"

"We're looking for something much more subtle, but we don't expect to find that, either."

"What makes you so certain that whatever it is you don't expect to find is there?"

"We're certain that there have been insurrections," Hargo said. "Take any absolute monarchy and mix in a nobility with no responsibilities, a powerful priesthood, a first-class army, and a closed order of civil servants, and you have four potential areas in which insurrection can develop. At intervals that combination would have to produce an uprising."

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"So why didn't anyone notice the possibility before?"

"Until Farrari tried it himself, there was no evidence that it'd ever happened. Now we know it has, because of the way the *rascz* reacted."

Jorrul turned to Farrari. "The way they reacted to the *olz*?"

"Yes. Anyone plotting revolution in this land would be bound to look longingly at the *olz*—they're such an obvious weapon, so easily available, so numerous, so willing to do what a *rasc* tells them, any *rasc*. Once such an uprising started, every *durrl* in the area would have to be eliminated immediately because he and his establishment would pose a threat to the control of the *olz*. A word from a *durrl* and the *olz* would turn in their tracks and go home. The fact that the *durrlz* and everyone connected with them ran at the first hint of an *ol* uprising could only mean that this has happened often enough for the *durrlz* to develop an instinctive reaction to it. If they don't run, they get their throats cut. And, of course, it isn't the *olz* they're running from, it's the *rascz* responsible for the uprising. The same applies to the conduct of the army, which ranged all about and through the *olz* but made no move at all to attack them or turn them back. They know their *olz*, and they know the *olz* wouldn't march on Scorv unless someone was telling them to. That was why they ignored the *olz* but immediately attacked the two assistant *durrlz*. They were looking for the treacherous *rascz* who were giving the orders only the *rascz*."

"They're still looking for them," Jorrul said.

"Of course. The reason they let the *olz* advance all the way to Scorv was to draw their *rasc* leaders into a trap. When they decided that the trap had failed they simply sent a *durrl* to speak the word that would send the *olz* home. They know that no one would be foolish enough to march the *olz* on Scorv without five divisions of rebellious *rasc* troops to back them up, and it's those troops that they're still looking for."

"I see. And now that Hargo knows that *rasc* history is riddled with insurrections, he has to go through all the records again to see if there's evidence that he overlooked when he thought there hadn't been any."

Hargo nodded unhappily. "Of course we don't expect to find anything."

"Delighted that whatever it is you don't expect to find isn't being found with my projector," Jorrul said dryly. "How's Liano?"

"Still normal," Farrari said. "And very happy. Hargo, you have another distinguished visitor."

Coordinator Paul scowled at them from the archway. "Farrari! The intercom has been blasting your name intermittently for the past half hour."

"Sorry, sir. Hargo has it turned off in here because it blasts all the time and he's trying to get some work done."

"Hello, Peter," the coordinator

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said to Jorrul. "Come and see me when you have time—if you can find me, I've lost my office. If you aren't too busy, Farrari, the sector supervisor would like to speak with you. That's the way he put it—'If Farrari isn't too busy, I'd like to speak with him.' "

"How busy would I have to be to be too busy to see a sector supervisor?" Farrari wanted to know.

As they threaded their way through the crowded corridor, the coordinator muttered, "In twenty-eight years in the service, I've never seen anything like this."

Farrari believed him. The regular staff resented the massive invasion by super-specialists, everyone was short-tempered because of the overcrowding, the mortality rate in sacred cows had been frightful, and several arguments had degenerated into physical combat. Earlier that day Farrari had heard a graying first-grade biologist call a balding zero-grade chemist a stupid fool, and the chemist responded by throwing a centrifuge, which fortunately missed. The only remarkable thing about it, on a day when a sector supervisor was using a world coordinator to run errands for him, was the mildness of the language.

The coordinator's office resembled a cramped military command post, and Sector Supervisor Ware looked as though he would be much more comfortable commanding an army. He pointed a finger at Farrari. "So you're the one who's responsible for this."

"No, sir," Farrari said firmly.

Ware's glare included Coordinator Paul. "You aren't the one? I told your coordinator—"

"I'm the one," Farrari said, "and I'm not responsible. I didn't create the *olz*."

Ware turned, said icily, "Will you stop that for a moment?" to an assistant who was coaxing data from the coordinator's stuttering desk computer, and scowled a staff conference into silence.

"No," he agreed. "You didn't create the *olz*, and it's beginning to look very much as if the *rascz* did, by centuries of what amounted to controlled breeding. How did you happen onto this notion that the *olz* are animals?"

"Are they?" Farrari asked. "Every place I go I find five people arguing about it."

Ware shrugged. "Might be animals, then."

"Looking back, I can find all kinds of reasons. *Olz* never commit suicide; animals don't commit suicide. The *olz* had no reaction at all when I arranged to have their dead speak to them; animals likewise wouldn't comprehend a message from the dead. Certain vital words are missing from what has been alleged to be the *ol* language—and so on. Looking back I can see that, but I won't pretend I saw any of it at the time. All I saw was that the *olz* have no culture."

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Ware said coldly, "If you'll pardon the expression—so what? I'd like some data. Are you prepared to prove that animals never have what you consider culture and that humans always have it?"

"The Cultural Survey Reference Library on this world consists of the fifth-year textbooks I was able to bring with me."

"Why didn't you ask your headquarters to research the question?"

"My 'headquarters' are here," Farrari said. "If you're referring to the Cultural Survey, *you* have the authority to ask—I don't—but if you ask don't expect an answer. The job of the Cultural Survey is to study human culture, so it doesn't go about looking for animal cultures, or even for humans who have no culture."

"I see."

"The conduct of your headquarters specialists isn't one that invites cooperation from other governmental departments anyway. Yesterday one of them wanted to know how I could be so certain that the sounds the *olz* make aren't a language. I asked him to define 'language' and he tried to hit me."

Ware smiled. "An expert is understandably embarrassed when he finds that a 'language' he's been studying for years isn't one. These *olz* seem to have a stable, repetitive existence and their sounds of communication are always made the same way, under the same circumstances, with always the same result, and to further complicate this they have more sounds than any animal has ever been known to use. The specialists naturally maintain that the *olz* do so have a language, or they would have noticed that the language they were studying isn't one."

"Perhaps so," Farrari said, "but right now a bulletin on syntax in the *ol* language makes rather droll reading. Either the *olz* are extremely intelligent animals, or they're rather stupid humans. It isn't my province to decide which. I merely raised the question."

"You certainly did."

"And just because I raised the question, these super-specialists seem to think I have some kind of obligation to answer it. I have a few questions of my own that need answers more urgently, and they won't let me work."

"What sort of questions?"

"For one, I wondered how the *olz* managed to survive, considering the treatment of them as shown in IPR records for this planet. There are hundreds of teloids showing *durrlz* beating *olz* to death and soldiers using *olz* for target practice, and so on, and if such scenes are as common as the teloids indicate, the *olz* should have become extinct long ago. Then it occurred to me that in all of my experience with the *olz* and as an *ol*, I never saw an *ol* mistreated. Not once. So the question is whether my experience was untypical or the records lie."

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"It deserves an answer. Have you found one?"

"Not one that I'd certify, but I *think* the explanation is that a *durrl* beating an *ol* to death makes a much more interesting teloid than a cube of an *ol* methodically cultivating tubers. Your agents don't care to waste teloid cubes on scenes that can be had by the thousands any time anyone wants to point a camera. So they record the unusual, and in any society there'll always be a few persons who are sadistic enough to gain pleasure from mistreating—"

"Animals? Or people?"

"Either, sir. And even a kind people may find it necessary to put their animals on a drastically reduced diet during winter."

"What you're saying, young man, is that IPR records of *any* world may present a distorted picture of that world."

"I'd say they're very likely to present a distorted picture, sir."

"Headquarters won't like that suggestion, but I agree that it should be looked into. What else?"

Two of the super-specialists burst into the room, one calling, "Farrari? Is Farrari in here?"

Farrari turned.

"Do the *olz* eat meat?" the specialist demanded.

"Never," Farrari said.

"There!" the other specialist said smugly. "Clearly a case of arrested evolution. Hunting and meat-eating develop the brain, the *olz* never hunted, so their cortices—"

"You can't know that until we obtain specimens for dissection. The question is whether they don't eat meat because they won't, or because they can't, or because they don't have meat to eat."

Farrari said politely, "I doubt that the present diet of the *olz* is much help to either of you. They eat what the *rascz* give them to eat. Before the *rascz* came they may have eaten nothing but meat."

"Not with those teeth!" the first specialist snapped.

"There's no incompatibility between *ol* type teeth and an omnivorous diet," the other said. "Look at your own teeth."

"I do, frequently, and I fail to see—"

The sector supervisor said mildly, "Gentlemen—" They left, and their argument faded away down the corridor.

"You were mentioning other questions," Ware said to Farrari.

"There are a number of them concerning the relationship of the *rascz* and the *olz*. The history section is working on them."

"The cave carvings?"

"Those and other things. There are some baffling inconsistencies. For example, when I led an *ol* uprising, the *rascz* paid no attention to the *olz*. When Bran, in the guise of an *ol*, assassinated a few *durrlz*, the army turned out, slaughtered whole villages of *olz*, and burned their huts. Dr. Grant thinks he has the answer

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to that—one of those strange Branoff IV viruses causes a peculiar type of madness in laboratory animals. The most timid grass eater will run amok and attack its predators, and its bite or scratch becomes virulently infectious. Garnt thinks that on rare occasions *olz* acquire the disease, and that the *rascz* have somehow learned that when this happens the only solution is to exterminate those already exposed and burn the huts they've lived in. In other words, the *rascz* knew that there was only one circumstance under which an *ol* would attack a *rasc*. When Bran murdered those *durrlz* they immediately concluded that the madness had struck again, and as a public health measure they reluctantly took the action they thought urgently necessary."

"It would seem," Ware said slowly, "that we have humanlike animals here, and that the *rascz* deliberately bred them to produce the kinds of work animals they wanted. Beyond that we have a great many questions. Go and get as many answers as you can."

The coordinator followed Farrari to the door. "Going back to your workroom?"

Farrari nodded.

"I'll come along. Since I can't use my own office."

They walked side by side. Ahead of them a base specialist and a superspecialist were engaged in what was obviously a long-standing argument.

"*Will you stop using that word* slave? *Aren't all domestic animals slaves?*"

"*Listen. I'm not arguing about whether the* olz *are human or animal. I'm telling you the* rascz *think they're human. Why else are they banned from the cities? No other animals are banned from the cities. Why else is their ownership a monopoly of the* kru? *All the other animals can be owned by anybody. Why else would the* rascz *train the* olz *to wear that sloppy clothing? None of the other animals wear clothing. Tell me this. Did you ever hear of a* rasc *eating an* ol?"

Still arguing, they disappeared around a corner. The coordinator and Farrari turned toward Farrari's workroom, and as they approached it a copy of the IPR Field Manual 1048K shot through Heber Clough's door—the room had long since been occupied by super-specialists—struck the wall, and bounced at their feet. The coordinator halted with a scowl.

"*Nothing fits!*" a voice exclaimed hoarsely.

"*Of course nothing fits. No society has ever existed with a deliberately-bred semi-intelligent domestic animal servant class. The Bureau's theories and rules couldn't possibly apply to a situation so incompatible with its previous experience.*"

Farrari grinned—the second statement was an approximate quotation from a lecture he'd delivered two hours earlier—and followed the coordinator into his workroom.

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They made themselves comfortable, and Farrari said, "I'm seriously thinking of going back. I can't get any work done here—people keep interrupting me."

"Go ahead," the coordinator said. "You can answer questions once a day by appointment on Jorrul's communication network."

"Why don't you move your office down here? I'm the only base specialist left with a workroom of his own."

"I'll think about it. I keep being interrupted, too, and moving my office wouldn't help. I spent my much interrupted afternoon yesterday trying to identify Bran for you, but I couldn't. There's no doubt at all about his being an IPR agent?"

"No doubt at all."

"Strunk is holding some photos for you to look at when you have time. Unfortunately, they're regular identification photos. We've never bothered to keep a file of photos of our agents in their native disguises. Now I suppose we'll have to. Is there anything new on the cave carvings?"

"The super-specialists are willing to go along with me if I'll explain why anyone would go to so much trouble."

"The possibility of overthrowing a government must have a certain allure to it," the coordinator said. "On any world people are likely to go to considerable trouble and expense."

"Someone did," Farrari said. "Someone who maybe thought past failures with the *olz* were due to their not being properly motivated. Obviously the *rascz* do think the *olz* are human, or at least they did in ancient times. They tried to use something that would have worked beautifully with their own race—a cult of *ol* supremacy with carvings showing *olz* as masters of Scorvif. After the insurrection was crushed, the *kru*—or his priests—was sufficiently impressed to keep a censored version of the cult going as the *ol* religion, perhaps to make certain that the same gimmick wouldn't be used again. The *yilescz* may have come into being at the same time, not to minister to the *olz*, but to spy on them. In some later insurrection the *yilescz* may have sold out to the rebels, which would account for their present ambivalent status."

"It's possible," the coordinator agreed. "On this world I'm beginning to think that anything is possible."

One of the linguists looked in, nodded at Farrari. "We make it eighty-two, but we can't agree on the variants. There may be as few as a dozen or as many as fifty."

"It amounts to a fair-sized pseudo-vocabulary," Farrari observed.

The linguist nodded. "If they're animals, they're unique."

"If they're human, they're unique, too," Farrari said.

The linguist went away, and the coordinator said with a chuckle, "All of this is shaking the Bureau to its time-honored foundations. Every problem world will have to be re-

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studied, and the Bureau doesn't have the right kind of specialists to do the job. It doesn't have a single expert in animal communication or sociology or anything remotely connected with such things. It's never needed any."

"If it'd had some, maybe they would have been needed," Farrari said.

Jorrul hobbled in and seated himself on an unused table. "Big ruckus at the other end of the corridor," he said. "Super-specialist claims this CS trainee Farrari states in a report that he saw the *olz* build a shrine to a dead *durrl* and worship him."

"Wrong," Farrari said. "I said that's what it looked like to me. What *they* thought it was I have no idea."

"Could the *rascz* have taught it to them?" Jorrul asked.

"It's very likely. Just as the *rascz* probably taught them their religion, if you want to call it that, and taught the *olz* of the caretaker villages to look after the dead. Obviously the *olz* have a startling capacity for learned responses, and just as obviously the *rascz* can't comprehend that there is no rationale whatsoever behind those responses. Or they couldn't comprehend it at the time they set up the religion. It all happened so long ago that very few *rascz* today are aware that the *olz* are supposed to have one."

"I've been asked for recommendations on future Bureau operations on Branoff IV," Jorrul said. "No one seems to have reached any conclusions about this thing—all they do is stand around and argue about it—but they want *me* to make recommendations for future operations."

"You might suggest that we try to influence the *rascz* to send expeditions beyond the mountains to search for new food plants," Farrari said. "It wouldn't surprise me in the least if they found some."

"It'd surprise me," Jorrul growled.

"It wouldn't surprise me, because I'd include in the recommendation the suggestion that IPR import some that are suitable for this world and plant them so they'll be there waiting for the expeditions."

"You're out of your mind!"

"This nonsense about strict adherence to principles in the face of dwindling food production that'll eventually destroy the world's only civilization has been carried far enough. Second, I'd recommend that IPR make a serious attempt to exploit the *malsz*."

"What are the *malsz*?" the coordinator wanted to know.

"Neighborhood gossip clubs," Jorrul said. "What's there to exploit about them?"

"They elect their own officers, don't they? And they have important responsibilities concerning sanitation and keeping the streets clean."

"If you want to call them important."

"Don't you think it rather remarkable that there are flourishing democratic institutions, however small and

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insignificant, right under the entrenched toes of an absolute monarchy? Combine the *malsz* into a city-wide organization, and you have the rudimentary basis for a national democracy."

"The *rascz* aren't ready for the idea," Jorrul said.

Farrari said disgustedly, "IPR *still* doesn't understand the incredible error it's made on this planet. It set up a two thousand year plan to democratize the *olz*, who need fifty or a thousand times that, and it virtually ignored the *rascz*, who are so ripe for democracy that they're fumbling toward it on their own. Here's another motto for your IPR manual: THE BEST WAY TO DETERMINE WHETHER OR NOT A PEOPLE ARE READY FOR AN IDEA IS TO SUGGEST IT TO THEM."

"All right," Jorrul said. "We'll suggest it. What about the *olz*?"

Farrari shook his head.

"Your second pilgrimage to the Life Temple bore results—did they tell you? The *kru* issued a stern order against mistreating an *ol*. The priests will also waste a lot of theology on your blunt statement that the *olz* are the *kru's* people, but that won't get the *olz* an adequate diet in winter."

"It'll take new food crops to do that."

"I'll suggest them. What's the object of this new complex of laboratories?"

"To learn," Farrari said.

"That sounds like an excellent suggestion, the kind Bureau Headquarters hardly ever turns down. As concerns the *olz*, I'll recommend that we learn something about them, with the added information that our local *ol* expert already has several laboratory programs in operation."

"As long as you don't identify the *ol* expert, that's satisfactory with me," Farrari said. "I'm being asked too many questions as it is."

Jorrul pushed himself to his feet and reached for his cane.

"Come and visit us?" Farrari asked.

"I will," Jorrul promised. "The first chance I get."

He hobbled away.

"Are you leaving right away?" the coordinator asked.

"Yes. Unless I'm ordered, I won't be back until the mob disperses."

"*I* won't order you unless someone orders me," The coordinator promised. "I think I will move in here. Thanks."

"Come and visit us?"

"As soon as I can get away."

Farrari walked slowly along the corridor, sorting out the unrelenting blast or argument that flowed from every workroom.

"Of course the olz *worship the* rascz. *There's hardly a populated world in existence that doesn't have some kind of domestic pet that worships its human masters, no matter how much those masters mistreat it."*

". . . Rascz *gave the* olz *a religion modeled on their own. Those burial*

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caves. Did you know about the cave under the city of Scorv? The rascz *bury their dead there."*

"Look. If the olz *are animals, maybe they have a highly developed sense of smell. Maybe that's why we lost so many* ol *agents. The* olz *could tell they weren't* olz, *and then—"*

"What's wrong with the condition of the olz?" Farrari paused to listen. *"Give me another example of a domestic animal that has their measure of independence. I say the* rascz *and the* olz *have achieved a unique symbiosis. Neither could exist without the other. And when, eventually, the* rascz *achieve industrialization, the* olz *can be bred to perform many routine industrial tasks."*

Farrari moved on, shaking his head slowly. He came to Isa Graan's supply section, and Graan greeted him with a smile. "Quite a madhouse, eh?"

"Quite," Farrari agreed.

"And no one to blame but yourself," Graan said with a chuckle. "All the visiting brass want to make the grand tour. Jorrul's men are complaining about being nothing but a glorified escort service, and my men are doing nothing but run platforms around Scorvif. But it can't last forever, I keep telling myself. They'll get tired and go home, and then we can get back to normal."

"We'll never get back to normal," Farrari said.

"Are those *olz* really animals?"

"I don't know."

"As long as you don't know, couldn't you have kept it to yourself?"

Farrari grinned, and Graan grinned back at him and slapped him on the back. "I've been wondering," Graan said. "Several of us have been wondering. Couldn't this whole gambit be something you thought up to make the IPR brass do something about the *olz*?"

"You don't fool a super-specialist with a gambit," Farrari said.

They climbed aboard a small platform and a moment later they were riding the cool night air in a rapid descent to the foot of the mountain. The platform landed; Farrari got out, softly called his thanks, and watched Graan take off.

For a moment he stood looking at the valley below, where an *ol* nightfire flickered. Then Farrari turned, the mountain opened before him and closed after him, and he went directly to the observation room. Liano greeted him with a smile.

"You escaped!"

He kissed her. "Base defies description. I shouldn't have gone back, but the sector supervisor . . ."

". . . Is fully aware of what an important man my husband is," Liano said, laughing.

"Anything new?"

She shook her head. "They look. And keep looking. But that's all."

Taking her hand, he sat down beside her. The screen above them showed the *olz* gathered around their nightfire. Farrari thought it ironic that the Bureau could do nothing for

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the *olz* as long as it thought them human—DEMOCRACY IMPOSED FROM WITHOUT, and all that—but when Farrari suggested that they might be animals, IPR set in motion the infestation of superspecialists from its highest headquarters and immediately approved an elaborate system of laboratories for observation and experiment. Whole villages were transported to the quiet, isolated valleys where IPR had trained its *ol* agents, and luxurious observation stations were constructed. There were even IPR agents disguised as *durrlz* and assistants, and the stiles were erected over the *zrilm* hedges each morning and taken down each night. IPR scientists were working with a village of *olz*, making physical, physiological, psychological and mental studies that should have been done long ago.

The *olz* were now believed to be loyal animals who loved their masters and preferred a sadistic beating to neglect, but they were nontheless *protohuman*, the almost-men whose evolution had been disrupted or—when they found this lovely, fertile land millennia before the *rascz* arrived—benignly arrested. To the scientists, that condition made them the most mysterious, the most critically, colossally important, the rarest life form in the galaxy, one standing midway between animal and intelligent being, whose existence had been postulated and theorized everywhere intelligent life existed but never before discovered. The *olz* were unique, and as a source where man could learn about himself they were beyond price.

Branoff IV would become the most important laboratory world in the galaxy, and the plague of visiting scientists would swell to a massive pollution. There would be studies and observations and experiments without number, all of them faithfully reported in an unending flow of treatises and theses and scientific papers that Farrari and Liano were determined to ignore.

They were concerned with the *olz* as they had known them, and their own experiment was and would remain unreported except to a few friends who shared their interest in it. Farrari had plastered clay on a slab of rock near the nightfire, and on it he had drawn a stick-figure *ol*. And the *olz* were looking at it. While the Bureau wrestled with its moral dilemma and attempted to adjust itself to a situation the authors of its capitalized mottos had never contemplated, while the scientists awesomely probed man's origins, Farrari and Liano would be exposing the *olz* to culture.

One day one of two things would happen: an *ol* would pick up a stick and try to draw a figure of his own; or an *ol* would suddenly comprehend that the drawing was of himself, and he would do what it told him to do: the dawn of creative thought from the spirit of art.

Soon, Farrari hoped.

He and Liano would be waiting. ■

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The efficient way of doing things is to have a strong, centralized Center of Command that makes all the decisions. Well-I . . . at least as long as the thing works at all . . .

F. PAUL WILSON

ILLUSTRATED BY VINCENT DI FATE

He didn't know how long he had been sitting there, looking out through the dirty window without seeing anything, when a movement caught his eye. A small dog, a mongrel with a limp, rounded a corner and loped down the near-deserted street. Something about the dog made him lean forward in his chair and stare intently. And while his eyes were riveted on the animal, his mind reviewed the events of the past few weeks in a effort to make a connection between the dog and the catastrophe that threatened Morgan City and the rest of the planet.

Decker Eiselt gnawed at a stubborn cuticle as he gazed from the flitter window. He was short, very dark and had an intelligent, fine-featured face. He was presently engaged in marveling at Morgan City which lay spread out below him. This was hardly the first time he had seen it from the air but the perfect harmony of its layout always managed to stir him. This was a city as cities should be—a *planned* city, a city that knew where it was going, a city with a purpose.

Discounting a few large islands, Kamedon had only one continent and Morgan City occupied its center, a fitting capital for a world that had become one of the centers of Restructurist ideology and the pride of the Restructurist movement.

Yes, Morgan City was beautiful as cities go, but Decker Eiselt preferred the coast. The university was there and the years spent near the sea in study and research had instilled a narcoticlike dependency in his system . . . without the continuous, dull roar of the surf and a certain, subtle tang in the air, he could never feel quite at ease, could never fully relax and feel at home.

And then there were the fishermen. During his stay in Morgan City he would miss rising early with the sun glaring on the water and watching the fishermen head out of the harbor as he and Sally ate breakfast. Most of the men on those slow, ponderous boats were salaried by the government fisheries but a few die-

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hards still insisted on free-lancing and trying to earn more by catching more. Eiselt detested their stubbornness but their spirit struck a resonance somewhere within him and he was forced to admit a grudging admiration for them—until they got out of hand, of course.

He idly wondered if there could possibly be any connection between the disorder at the local fishery the other day and his being called to Morgan City, but promptly dismissed the thought. He was a research physician and had nothing to do with fisheries. And besides, the incident had been minor by any standard, just some pushing and shoving at the pay window. Some of the local fishermen—the free lancers especially—had become angry when the pay authorizations were delayed. Nothing to get excited about, really; this was the first time such a delay had ever occurred and would no doubt be the last. The Department of Sea Industries was far too efficient to allow such an oversight to happen a second time.

They were coming in for a landing, now. The roof of the Department of Medicine and Research's administration building grew large beneath them as Eiselt's darting brown eyes strained to recognize the figure waiting below. It was Dr. Caelen, no doubt. Eiselt hadn't liked being called away from his work for some mysterious reason that would not be explained until he arrived in Morgan City, but an unmistakable note of urgency had filtered through the message. And so Decker Eiselt chewed a cuticle as he did whenever he was puzzled. What was the urgent need for a research physician? And why the mystery? He smiled grimly. No use in getting worked up about it; he'd know soon enough. He didn't have much choice in the matter, anyway: when Dr. Alton Caelen summons you to the capital, you go to the capital. Immediately.

The flitter touched down with a jolt and Eiselt, the only passenger, hopped out as soon as the engines were cut. A lean, graying man in his fifties stepped forward to meet him.

"Decker!" he said, shaking his hand. "Good to see you!"

Eiselt couldn't reply. Was it . . . ? Yes, it was Dr. Caelen and he looked terrible! Bright eyes gleamed from sockets deep-sunk in a lined and haggard face. "Dr. Caelen!" he stammered. "I . . ."

"I know," the older man said quickly. "You're about to say I look like death warmed over and you're right. But we'll talk about it downstairs." Caelen led him to the elevator and kept up an incessant flow of trivia on the way down, punctuating each phrase with quick, nervous gestures.

"How's the wife? Very pregnant and very happy, I suppose. Lovely girl, Sally. Dr. Bain's taking care of her, I suppose. Good, good. How about that little disturbance out your way? Unfortunate, very unfortunate.

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But things may get worse before they get better. Yes, they may well get worse."

Stimulants? Eiselt asked himself. Dr. Caelen was definitely hyper. He had never seen the man so worked up. After reaching his office, however, he visibly sagged and Eiselt could no longer contain himself.

"My God, Doctor! What's happened to you?"

"I'm not sleeping very well," he replied simply and calmly.

Under normal circumstances, Eiselt would have waited for an invitation before sitting down but these weren't normal circumstances. He grabbed the nearest chair and, without taking his eyes off Caelen, slowly sank into it. "There must be more to it than that. A sedative will cure insomnia."

Caelen followed Eiselt's lead and fell into the chair behind his desk before answering. "There's not much more to tell, really," he said, putting his hands over his temples and resting his elbows on the desk top. "I just can't seem to get enough air at night. When I doze off, I wake up a few minutes later, gasping frantically. And it's getting worse."

Eiselt repressed an audible sigh. Pulmonary diseases had been his field of research for the past ten years and he felt as if he were on firm ground again. His muscles relaxed somewhat and he settled more comfortably into the chair.

"Was the onset of symptoms slow, or abrupt?" he asked.

"Slow. So slow that I didn't become concerned until recently. But I can trace it pretty clearly in retrospect. The symptoms started showing up during my daily exercises—"

"You mean you have respiratory troubles during periods of exertion, too?" Eiselt interrupted.

"Yes . . . sorry if I gave you the impression that I'm only bothered when I'm trying to sleep. The problem isn't that simple. You see, about nine months ago I started noticing little irregularities in my breathing rhythm as I exercised. I didn't pay too much attention to it at the time but it's got to the point where short, simple exercises, that I formerly performed with ease, leave me gasping for air. Two or three months ago I started having sleeping problems. Nothing much at first: restlessness, insomnia, inability to sleep for more than an hour at a time. Things have progressed to the present stage where I can hardly sleep at all. And, unless I concentrate fully on my breathing, I can't exert myself in the slightest."

"Are you having any difficulty right now, just sitting and talking?"

"Only a little, but I find myself out of breath at the oddest times."

Eiselt mused a moment. "The syndrome, as you've related it, doesn't ring a bell. I'd like to make some tests, if I may."

"I figured you would," Caelen said and managed a smile. "The lab downstairs will be at your disposal."

"Good. But one question: Why

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me? There are plenty of others in Morgan City who could handle this, many of them right in this building. Of course I'm honored that you thought of me but I am, after all, a research physician."

"I wanted you here for a number of reasons," Caelen stated. "Central among them was the fact that there isn't much you don't know about respiratory pathology. The others I'll explain to you after you've made your tests."

Eiselt nodded. "O.K., but one other question, if you don't mind: What psychological symptoms? If you're losing *rem* sleep . . ."

"I'm as irritable as hell, if that's what you mean. It's only with the greatest exercise of will that I keep myself from biting off the head of anyone I meet, including you. So stop quizzing me and get on with your tests!"

"Well, then," Eiselt said, rising and smiling, "let's go." He didn't know what was plaguing Caelen but was confident he could come up with an answer in a short while. No doubt it was a variation on another familiar syndrome.

Later in the day he wasn't so sure. All his tests for pathology had come up negative. Strange, a man with Caelen's symptoms should certainly show some pathology. Feeling not a little embarrassed, Eiselt took the elevator to the upper levels. Dr. Caelen had taught at the university before the Department of Medicine and Research decided to move him into Administration. He now headed that department and Eiselt, one of his former students, had wanted to look good for the old man.

Dr. Caelen awaited him in his office. "Well, Decker, what have you found?"

"Frankly, I'm a little at a loss," he admitted. "Your lungs are in great shape. You shouldn't have the symptoms you do."

He paused, but Caelen waited for him to go on.

Obviously crestfallen, he concluded: "I'm afraid I'll need some more data before I can even guess which way to go."

"Don't feel too badly about it," Caelen told him. "Nobody else knows what's going on around here, either—and we've had the best working on it. I knew you'd want to make those tests yourself and draw your own conclusions so I let you."

"Thanks. That makes me feel a little better. But now I'd like to know those 'other reasons' for sending for me."

Caelen nodded. "O.K. Tell me: have you noticed anything unusual about our personnel?"

"To tell the truth, the building seems almost deserted."

"True, that's part of the problem. But what about those you *have* seen?"

"They all look pretty beat," he replied after a pause, "almost like . . . Doctor, is there an epidemic of this syndrome?"

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"Yes, I'm afraid so," Caelen said.

"Why haven't I heard anything about it?"

Caelen sighed. "Because we've been doing our best to keep the lid on it until we find out just what it is we're dealing with."

"Does it seem to be spreading?"

"Most suburban hospitals are packed with cases, but they're not as bad off as the city proper. It seems as if the entire population of the capital has come down with this . . . this syndrome. And we've also had reports of isolated cases from coast to coast. Figure that one out!"

Eiselt's teeth found a cuticle and went to work on it. "I have an instinctive feeling that this isn't the work of any pathogenic organism, known or unknown. Yet, an epidemic usually means contagion . . ." His voice drifted off into thought.

"Speaking of contagion," Caelen said, "I must apologize for exposing you to whatever it is that's plaguing us but we needed someone who was uninfected to work on it. The rest of us are so exhausted that we can't think straight about any subject other than sleep. We don't trust our own judgment. I hope I haven't endangered you, but you must understand that we're getting desperate. None of the departments can get anything done because no one can concentrate anymore. That's why the Department of Sea Industries made that error with the pay authorizations. And there have been a number of other, similar cases. The Department of Public Information has been keeping it quiet but little things have a way of piling up. We may soon have a very frightened planet on our hands if we don't come up with something soon. I tried to handle it myself but my stamina has been completely sapped."

"Could it possibly be a Federation plot?" Eiselt asked.

Caelen repressed a smile. Decker Eiselt hadn't changed much. He had been an adamant Restructurist during his college years and had evidently remained so. "Ridiculous, Decker! The very reason we want to 'restructure' the Federation is because it limits itself exclusively to interplanetary affairs. A plot against Kamedon would be strictly out of character."

"But you have to admit that the Federation would hardly be dismayed if the people lost faith in the government and the planet ground to a halt."

"You've got a point there, but you must realize that the Restructurist movement will go on, with or without Kamedon. And you can't go around looking for a Federation plot every time something goes wrong."

"I suppose you're right," Eiselt reluctantly agreed.

"Of course I'm right! So let's not worry about the Federation or Restructurism. Let's worry about Morgan City. I don't want to have to call in the IMC."

Eiselt blanched. "The Interstellar Medical Corps is pro-Federation!

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Asking them for help is like going to the Federation itself!"

"Well, then," Caelen said pointedly, "I hope you've got some sort of a plan on how to tackle this."

"I've got the start of a plan. Those isolated cases might provide us with a clue. I'd like to have every one of them flown to the capital as soon as possible."

"Good idea," Caelen agreed, swallowing another stimulant.

After two weeks of testing and interviewing patients from the outlying districts, Eiselt was able to hand Dr. Caelen a piece of paper with a date scrawled on it. "Remember that day?" he said.

Caelen hesitated. "No, can't say I do." Daily he and all the other victims had grown more haggard and exhausted. Remembering was an effort. "Almost a year ago . . . wait! Wasn't this the day of the accident in Dr. Sebitow's lab?"

"Correct. And how does this strike you: every case I've interviewed was in Morgan City when the accident occurred!"

Caelen slumped in his seat. "Sebitow's ray," he muttered.

"What's that supposed to mean?"

"I don't know. No one really knew except Sebitow—and he's dead."

Eiselt's tone showed his exasperation. "But the department gave him the money! You must know what he was working on!"

"What do you know about administration, Decker?" the older man flared. "How do you handle a man who is one of the greatest medical minds in the galaxy but who has no conception of politics, who has no loyalty to anything but his work? To Nathan Sebitow the Federation and the Restructurist movement were just words! The only way to keep a man like that working for you is to give him full rein. A number of other planets had offered him unlimited funds and unlimited freedom so we had to match them. He said he was onto something big and wanted the money immediately, so we gave it to him."

"But don't you have any idea what he was doing?"

Caelen paused. "All we know is that he was working on a high-penetration radiation with neuronal effects. When he worked out a few bugs he was going to give us a full report. Decker, you don't think the Respiratory Center could have been affected, do you?"

"Not a chance," Eiselt replied with a slow shake of his head. "The Respiratory Center is intact and functional. Were any of Sebitow's records recovered?"

"None."

"But wasn't he still alive when they found him? I remember a report about Sebitow being taken to a hospital . . . did he say anything?"

"He said a few words," Caelen replied, "but they didn't make too much sense."

"Remember what they were? It might give us a lead."

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"Not really. Something about an over-reaction, I think."

"Please try to remember!" Eiselt urged.

Caelen shrugged. "We had a recorder going when he came around. If you think it's important, go down to Hearn's office and he'll play it for you."

Dr. Hearn, too, was gaunt and haggard and really didn't want to be bothered with retrieving a recording of Dr. Sebitow's last words. His last stimulant was wearing off.

"I'll tell you what he said, Dr. Eiselt: 'Over-reaction . . . danger . . . tell . . . ens . . .' That was all."

"Yes, but I'd like to hear it myself. I know what you're going through but I'm trying to find a key to this mess. Please get it."

Wearily, Hearn went to a file, pulled out a cartridge and fitted it into a viewer. For seemingly interminable minutes Eiselt watched the injured Dr. Sebitow toss his bandaged head and mumble incoherently. Suddenly, the man opened his eyes and shouted, "Over-reaction! Danger! Tell . . . ens . . ." and then relapsed into mumbles. Hearn switched it off.

"What did he mean by 'ens?' " Eiselt asked.

Hearn shrugged. "That puzzled us for a while until we remembered that his chief assistant's name was Endicott. He must have wanted someone to tell Endicott something but never finished the sentence."

"Endicott? Where is Endicott?"

"Dead, too."

Eiselt rose wordlessly and started for the door.

"We've got to get to the bottom of this soon, Doctor," he heard Hearn say behind him. "Do you know that all surgery is being performed under local anesthesia? Put a patient out and he starts to die right on the table—he stops breathing! And stimulant supplies are diminishing. The Department of Production is so understaffed that it hasn't been able to issue the latest production quotas and so factories and mills all over the continent have had to shut down. We've actually had food riots in some areas because the Department of Distribution has fouled up its scheduling. There's even talk of a march on Morgan City to demand more competence and efficiency in the handling of public affairs!"

"I'm doing the best I can!" Eiselt gritted.

"I know you are, and you're doing it almost single-handedly. It's just that I dread the thought of having to call in the IMC. But I fear it must come to that if we don't get a breakthrough soon."

"Never! If we can't lick this thing, they certainly can't do any better!" he declared, approaching Hearn's desk.

"Come now, Doctor," Hearn replied. "I know you're a dedicated Restructurist, as are we all, but let's be realistic. The IMC has the brains, talents and resources of a thousand

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worlds at its disposal. You can't hope to compare our facilities with theirs."

Eiselt slammed his fist on the desk top. "We'll solve this and we'll do it without the help of the IMC!"

"I hope you're right," Hearn said softly as he watched Eiselt storm from the office. "And I hope it's soon."

Eiselt managed to cool his temper by the time he made his daily call to Sally. As her face came into focus on the viewscreen, he noticed that she looked distraught.

"Something wrong, honey?" he asked.

"Oh, Decker!" she cried. "They've gone!"

"Who?"

"Almost everyone! Students, faculty, administrators, fishermen, shopkeepers, everyone! They chartered groundcars and flitters and started out for Morgan City this morning!"

Eiselt remembered the march Hearn had mentioned. "What about Dr. Bain?" he asked with concern.

"Oh, he's still here. His wife wants me to stay with them until you get back. Maybe I'd better take her up on it." The exodus from town had made her somewhat anxious and Eiselt wished he could be with her.

"Good idea," he said. Ed Bain would look after her. After all, she was his patient and in her eighth month and if her husband couldn't be there, someone should keep an eye on her. "Get over there as soon as possible and tell them I'll be eternally grateful!"

She ran a hand nervously through her brown hair. "O.K. Any luck so far?"

"No. Every time I think I'm onto something, I wind up in a dead end."

The frustration was evident in her husband's voice and Sally figured that the best thing she could do for him was allow him to get back to his work. "I'd better get packed now," she told him. "Call me tomorrow."

"I will," he promised and broke the connection.

Depression was unusual for Decker Eiselt. In the past his nervous energy had always carried him through the troughs as well as over the peaks. But he felt drained now. He took the elevator down to street level and dropped into a chair by the window. That was when he spotted the dog.

It was the dog's gait that held his attention; the uneven, limping stride reminded him of another dog . . . years ago . . . at the university.

Suddenly he was on his feet and racing for the elevator. He shot to the upper levels and burst into Caelen's office just as the man was about to take another stimulant capsule.

"Don't take that! I've got one more test to make and I want you to try and sleep while I'm doing it."

Caelen hesitated. "I'm afraid, Decker. I'm afraid I may not wake up one of these times."

"I'll be right there," he assured him. "I want to monitor your cortex while you sleep."

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"Are you on to something, Decker?"

Eiselt pulled him to his feet. "I'll explain as I wire you up. Let's just say that I hope I'm wrong."

Supine on a table, a very groggy Dr. Caelen tried valiantly to focus his eyes on the oscilloscope screen and concentrate on what his younger colleague was saying.

"See that?" Eiselt remarked, pointing to a series of spikes. "There's an unusually high amount of cortical activity synchronized with respiration. Put that together with the symptoms of this epidemic, the nature of Sebitow's research and his last words and the result is pretty frightening. You see, I fear Sebitow's last words were a warning."

"A warning against what?"

"Telencephalization!"

There was no sign of recognition in Caelen's eyes. "It's a neurophysiologist's term," Eiselt explained. "If a lame dog out on the street hadn't reminded me of it, the concept never would have occurred to me."

"Forgive me, Decker, but I'm not following you."

Eiselt paused. "Maybe this will help you remember: the most common and effective means of illustrating telencephalization is to take an experimental animal and sever the spinal cord at midthorax, or at the neck. If that happened to a man, he'd lose the use of his legs in the first instance and also the use of his arms in the latter. But an animal with a severed spinal cord—a dog or possum, for instance—can still walk! His gait is often irregular but the point is *he can still get around while a man is rendered helpless.* Why? Because man has telencephalized his walking ability! As part of his evolution, the higher centers of man's nervous system have taken over many sensory and motor functions formerly performed by the lower, local centers.

"I have a theory that Sebitow might have developed a way to cause telencephalization, possibly for use as a rehabilitation technique . . . to let higher centers take over where damaged local centers are no longer effective. But I fear the city got a blast of the radiation he was using to induce this takeover and the symptoms we've seen led me to the conclusion that somehow the respiratory center has been telencephalized. The encephalogram seems to confirm this."

"But you said nothing was wrong with the respiratory center," Caelen rasped in a weak whisper.

"There's no pathology, but it seems that the voluntary areas of the forebrain are in command and are overriding the local peripheral sensors. Thus the diffuse respiratory malaise and broken breathing rhythm when you exercised. The voluntary areas of the cortex were starting to take over and they are nowhere near as efficient nor as sensitive as the local centers such as the pressoreceptors in the lungs and the chemoreceptors in the aorta and

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carotid arteries which work directly through the respiratory center without going near the cortex. But because of telencephalization, the respiratory center is no longer responsive to the local centers. And there lies the problem.

"It boils down to this: You and all the other victims are breathing on the border of consciousness! This means you *stop* breathing when *un*conscious! without oxygen the acidity of your blood goes up and the local chemoreceptors start screaming. But the respiratory center no longer responds and so impulses are finally relayed to the cortex; the cortex is roused and you wake up gasping for air. That's the theory. I want to monitor the voluntary areas to confirm or deny it; if activity there falls off as respiration falls off, then we'll know I'm right."

"What'll we do if you're right?" Caelen asked.

Rather than tell him that he didn't have the faintest idea, Eiselt pulled a blanket over him. "Try to sleep." The exhausted administrator closed his eyes. Eiselt watched him a minute, then went over to the drug cabinet and filled a syringe with a stimulant. Just in case.

As he sat and watched the oscilloscope, a dull roar filtered up from the street. Going to the window, he saw a shouting, gesticulating crowd marching along the street below. They were frightened, and they were angry, and they wanted to know what was wrong. Kamedon had been running so smoothly . . . now, chaos. Some areas were receiving no food while others received more than they could use; some factories were shut down while others received double quotas; and no one could be sure when he would next be paid. What was happening? The famous efficiency of Kamedon was breaking down and the people wanted to know why.

Someone broke a window. Somebody else followed suit. Fascinated, Eiselt watched the march turn into a mob scene in a matter of minutes.

He glanced over at Dr. Caelen and realized with a start that the man had stopped breathing. He cursed as he noted the reduced cortical activity on the 'scope. Telencephalization of the respiratory center—no doubt about it now. He put a hand on Caelen's shoulder and shook him. No response. Looking closer, he noticed a blue tinge to the man's lips. With frantic haste he found a vein and injected the stimulant. Then he began artificial respiration.

Slowly, as normal breathing returned, Dr. Caelen's eyelids opened to reveal two dull orbs. Cortical activity had increased on the oscilloscope.

Decker Eiselt's shoulders slumped with relief—and defeat. He was beaten. Telencephalization was an evolutionary process—although in this case the evolution was suicidal—and he had no way of combating it, no way of returning command to the

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local centers. The only hope for Dr. Caelen—and Kamedon—was the IMC. And Eiselt knew he would have to be the one to call them in.

They would be gracious rescuers, of course, and would do their work skillfully and competently. The IMC would find a solution, rectify the situation and then leave, no doubt refusing to accept payment, explaining that they were only too glad to have such an opportunity to expand the perimeters of neurophysiology.

But it would soon be known throughout the settled galaxy that Kamedon, the pride of the Restructurist movement, had found it necessary to call in the IMC. And pro-Federation propagandists were sure to waste no time in drawing an ironic comparison between Restructurist philosophy and the syndrome which had afflicted Morgan City. He could see it now: *"Centralists suffering from overcentralization!"* To put it mildly, the near future was going to be a most difficult period.

Outside, the roar of the mob redoubled.

IN TIMES TO COME

The next issue leads off with a new novel—"The Outposter"—by Gordon R. Dickson. It's been obvious for a long time that the interests of the Colonies and the interests of the Home Country are not always—or even often!—entirely congruent. But when it comes to the Colony Planets vs. the Home World vs. the Aliens—then the gap can really get wide, hot, hateful and violent. Particularly because pioneering Colonists tend to be gamblers; they wouldn't have gone Out There if they weren't willing to take chances with life and fortune. And the Home World is conservative, wanting most of all to hold on to what they have. And as to which is the worst enemy, Aliens or Home World, can get to be a difficult question!

With Gordy Dickson telling it, you can expect a yarn!

THE EDITOR.

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P. Schuyler Miller

THE VIEW FROM OUTSIDE

Those of you with contacts in the academic world know that science fiction—or something tagged with the same name—has been discovered by literary commentators, critics and historians. This has been true for some time in Europe, but it has also been going on in the United States, where the Modern Language Association holds annual SF symposiums and publishes a magazine of SF commentary—which I haven't seen. In the past year there have been three book-length studies of science fiction by people outside the SF inner circle of writers, editors and fans—Benjamin Appel's juvenile history, "The Fantastic Mirror" (Pantheon, $3.95), on which I commented here last fall; "Into the Unknown" by Professor Robert M. Philmus of Loyola College, Montreal (University of California Press; 174 pp.; $6.95); "The Shattered Ring" by a team of religious writers, Lois and Stephen Rose (John Knox Press, Richmond, Va.; 127 pp.; $3.50).

Two important "inside" commentaries on science fiction will also be out by the time you see this: Donald A. Wollheim's "The Universe Makers" (Harper and Row, New York; 128+ pp.; $4.95), which I have read in proofs, and a new collection of critical essays by "William Atheling"—James Blish's alias as SF's severest "family" critic—from Advent in Chicago. I have made several attempts at covering the Philmus, Rose and Wollheim books in this month's department and given it up as a bad job. I'll save most of Wollheim, and Atheling if it's out, for next month.

"Into the Unknown" is a typical hard-nosed scholarly study in the full academic tradition. It is thoroughly documented, and almost worth reading for the footnote references to what is evidently only a fraction of the academic literature on science fiction and SF writers. However, it is subtitled "The Evolution of Science Fiction from Francis Godwin to H. G. Wells," and refers only passingly to the present form of the art. Those of you who are not antiquarians may find it too academic and antique to be of interest.

Stephen Rose is a young student

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of and writer on theological questions, whose wife evidently reads science fiction and fantasy for enjoyment rather than enlightenment. (They make a number of rather odd mistakes, such as calling Stapledon a discovery of the early Campbell/Astounding era, treating Wells as an "uncanny" forecaster of future technology, and seeing Leibowitz of Walter M. Miller's classic "Canticles" as a theologian rather than a technician whose name became attached to a creed almost by chance.)

Both Philmus and the Roses make little distinction between science fiction and fantasy. With Philmus this seems to be a question of precision: to him anything not literally true is fantasy, and he uses SF to mean "science fantasy" rather than "science fiction." With the Roses, I don't think they know or care about such distinctions. Their interest in what they call "a third cousin of literature" results from their argument that science fiction explores ideas that used to be the prerogative of theology—and does so more freely and without the restrictions inherent in "revealed truth." They naturally devote a good deal of space to C. S. Lewis, but credit writers like Theodore Sturgeon, James Blish and "even" Heinlein with having "a more profound understanding of evil than the confessing theologian," Lewis.

Philmus defines science fiction as a "rhetorical strategy of employing a more or less scientific rationale to get the reader to suspend disbelief in a fantastic state of affairs." He recognizes its didactic function of making the abstract seem concrete and the extraordinary seem ordinary, but excludes satiric and utopian fiction, which most of us consider important to modern science fiction, as well as SF adventures of the Burroughs-*Planet Stories* type. Donald Wollheim, as might be expected, has a more realistic attitude.

In the space we have, it may be worth commenting on one point which Philmus and Wollheim both make: the basic split in science fiction which becomes manifest with Verne and Wells, and has grown wider as the field evolves. To appreciate Philmus's argument you will have to read him, and to assimilate specialized academic jargon that is perhaps more difficult than the teenage patter in Burgess's "Clockwork Orange." His thesis is that Verne and writers of his school exemplifies the use of "private myths"—a personal view of the world, such as we have seen—beyond the scope of Philmus's study—in the intricately constructed future worlds of Isaac Asimov's "Foundation," Robert Heinlein's "Future History," and the interwoven threads employed by "Cordwainer Smith" and Andre Norton. Wells, on the other hand, represents the use of "public myth"—society's view of the world—to develop science-fictional themes.

Wollheim makes a similar dis-

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tinction rather less academically and a good deal more bluntly—of which more next month. He sees Verne as "a small-minded French bourgeois nationalist" fascinated with gimmicks and gadgets, well satisfied with his Nineteenth Century society, and more or less willing to project it into the indefinitely far future, but with no real interest in society, or sociological development. He considers Analog the last stand of the Verne genre and John Campbell its prophet. Wells, on the other hand, began with future projection and social satire in his first and best books—although he contributed more basic themes and gimmicks to science fiction than Verne—who criticized him for it. The English *New Worlds* and New Wave are thus Wells's logical heirs.

If I understand Philmus, he might—if he concerned himself with them—depart from Wollheim's point of view in this last respect. He sees SF writers before Wells as sharing classical education's concern with philosophical concepts, so that they consciously involved these concepts in their fiction and used it to develop them. In this interpretation, SF writers from Wells down to our own time have been more concerned with extrapolating the reality seen by science . . . but the new writers may have come full-circle and returned to the academic approach. The technically oriented mid-generation, who lacked the academic and philosophical background that Philmus and the Roses exemplify, either explored it privately—Blish, Knight—or rather clumsily "rediscovered" themes that the classicists had sucked dry in the Eighteenth and Nineteenth centuries.

Of the "insiders," whom I'll discuss next month, Wollheim is wide-ranging and sometimes critical; as the editor of Ace Books' thoroughly eclectic SF paperbacks, he is completely out of sympathy with Analog's approach. Blish, as "Atheling," will undoubtedly be much more critical but probably less intuitional; he knows what he likes, but he also knows why.

DREAD COMPANION

By Andre Norton • Harcourt, Brace Jovanovich, New York • 1970 • 234 pp. • $4.95

All, or nearly all, of Andre Norton's books about the far future are based on the same major premise. As mankind spreads out from Earth among the stars, generating new subspecies under the strange conditions of strange worlds, developing new centers for exploration, new institutions, new customs, the explorers and pioneers come upon the traces of Forerunners whose civilizations have been born, flourished and vanished thousands and millions of years before. These lost beings have had strange shapes, though most of them were close to human form, or could take it. Above all, they have had personal powers and scientific knowledge that men have not yet de-

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veloped. Some of these relics of the Forerunners can be boons; many of them are dangerous to ignorant fumblers, to whom they seem like magic. In some human beings, too, a trace of the old races is sometimes reborn—perhaps though something like our cruder molecular biology.

In this confrontation with the Forerunners, Andre Norton has also used the suggestion that some of the sprites and monsters of Earthly folklore are memories of these other races. Her heroine, Kilda c'Rhyn, sees the chance to get off her own cramped world by taking a job as *nurse/companion to a pair of peculiar children*, on a colonial world. But the girl, Bartare, acts strangely and seems to listen to unheard voices, and presently they all go through a conventional enough science-fictional "gate" into another continuum where some of the Forerunners live and gather strength for a return to our universe. They find a spaceman who has been wandering there for centuries, and who helps Kilda find a way out for herself and the reluctant children.

Miss Norton never answers all the questions she raises, never resolves all the mysteries she unveils. This seems to drive teacher and librarians up the wall, but I trust that youngsters appreciate the opportunity to use their own imaginations, so that a book is different for everyone who reads it. I know I am still haunted by the dryad-like folk of her "Janus" books, another unfinished story to which I hope she will return.

Let's put it another way. She shows us a universe where there are many quarks, and where some people, in some places, glimpse a whole new science of their nature and control. It can be a terrifying universe, and a hostile one, but it is always fascinating.

THE HOUSE IN NOVEMBER
By Keith Laumer • G.P. Putnam's Sons, New York • 1970 • 192 pp. • $4.95

A condensation of this book was serialized in *If* at the end of 1969 as "*The Seeds of Gonyl.*" It is run-of-the-mill Laumer, without even the hilarious tongue-in-cheek corn of his Retief yarns. Frankly, it belongs back in the days of *Planet Stories,* except that the initial puzzle is better constructed and the hellbent save-the-world stampede holds off till near the end.

Jeff Mallory "wakes up" one November morning, in his hometown in the middle of Nebraska, to find three months lost and the world totally changed. Beatrice has become almost a ghost town, his wife and children and neighbors zombies at the command of other humanoid monsters from a gigantic tower rising above the prairies. He escapes, and finds the outside world almost as empty and almost as strange. An army of Americans and Russians is preparing to wipe out the stronghold of the Red Chinese which they are sure have invaded America and oc-

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cupied Beatrice. A cultist group has just as strong convictions about a totally different situation. And there is the Old House, which he remembers from his uncle's stories and his childhood dreams, which he must somehow reach.

The more the problem is clarified, the less it seems to matter. Too bad; it starts well.

REPRINTS IN HARDBACK

Walker and Company are publishing hardbound reprints of outstanding science fiction novels, most of which originally appeared as paperbacks—at least, in the United States. This opens library shelves to them, and it should answer a crying need of many private libraries as well. Here are some of the latest:

THE STAINLESS STEEL RAT

By Harry Harrison • Walker & Co., New York • 1970 • 158 pp. • $4.95

The exploits of Slippery Jim Di Griz, the super-crook who was made into a cop and set on the trail of a female of the species, as potent as himself. It's far better than the sequel, which Walker has also published.

THE WANDERER

By Fritz Lieber • Walker & Co., N.Y. • 1970 • 318 pp. • $5.95

The Hugo-winning novel in which a traveling planet invades the solar system and wreaks physical and social havoc on Earth. Utterly unlike anything else Fritz Leiber has written.

I AM LEGEND

By Richard Matheson • Walker & Co. • 1970 • 122 pp. • $4.95

A virus turns mankind into vampires. Robert Neville was immune, so he is the last non-vampire alive. I didn't see the first film version, "Last Man on Earth," but they're doing it again with Charlton Heston.

A GIFT FROM EARTH

By Larry Niven • Walker & Co., N.Y. • 1970 • 254 pp. • $4.95

Mount Lookitthat is a mountaintop on an uninhabitable planet. The elite of the colony that was set down there by mistake maintains itself by organ transplants from the lower crust. Comes the revolt. . .

NIGHTWINGS

By Robert Silverberg • Walker & Co., N.Y. • 1970 • 190 pp. • $4.95

The separate parts of this remarkable story of the far future are winning awards that will probably kill the book's chances of getting a prize of its own. Read the complete book, by all means.

RE-BIRTH

By John Wyndham • Walker & Co., N.Y. •1970 • 185 pp. • $4.95

This is the only one of the lot with previous hardback publication in the U.S. It was one of the titles in Ballantine's short-lived simultaneous hard/paperback series, and a classic in its own right. It is the story of a post-nuclear-war society in which mutants are destroyed with religious fervor. Of course, the hero has mutant talents . . .

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THE DARK SYMPHONY

By Dean R. Koontz • Lancer Books, New York • No. 74621 • 205 pp. • 75¢

ANTI-MAN

By Dean R. Koontz • Paperback Library, New York • No. 63-384 • 142 pp. • 60¢

Dean Koontz is one of the harder-working of the new writers, a teacher in the English Department of a smallish eastern Pennsylvania college who represents the new trend in science fiction. By this I do not mean the much extolled "New Wave," cresting out of England and more concerned with form and technique than content. I am referring to a generation of new writers who apparently do not—or most of whom do not—have the scientific and technological background of the older writers we think of as the "Astounding" school. Their backgrounds, instead, are academic—literature, music, art, the humanities—and in too many instances, "science" enters their stories only as what would once have been a called a "conceit," a gimmick, or a bizarre stage set against which or within which the action takes place.

In "The Dark Symphony" this basic premise is physically quite invalid: that in some way "science" can give sound waves all the properties of matter—solidity, texture, color, compressional and tensional strength, electromagnetic fields—so that cities can be built, monsters created and destroyed, fantastic weapons employed, all of projected sound. I presume this is an extrapolation of the effects of a shock wave or a standing wave, but I can't see any physical logic to make it even plausible.

This gimmick out of the way, though, we have a lively story of a future Earth ruled by a caste or species, the Musicians, who have made a fetish of classical music and who order their society through a rite of passage which combines trial by music with trial by combat. Contrasting with them are the dregs of Earth's original population, "mutants" denning in the ruins of the ancient cities, who turn out to be humanoid monsters created by the biological play of the Musicians. Guil, the hero, is a Popular changeling planted among the Musicians and conditioned to trigger a revolution—but nurture as well as nature is working on him. It is a familiar story, but well told, and it didn't need that untenable first premise of solid sound.

"Anti-Man," on the other hand, is more conventional in theme and handling, but has fewer scientific choking points—a "bootstraps" rationalization of magnetic sleds is the worst. Actually, the basic theme is fairly original and might once have been controversial. In our time it may have lost its fire.

The narrator is a biologist, Kennelmen, who has had a hand in the creation of the world's first android. This creature, Sam, turns out to be too much of a good thing. He has regenerative and reconstructive pow-

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ers far beyond anything known to normal science, he may well be immortal, and he promises to teach these powers to an overcrowded world. The World Authority decides to destroy him before he can create havoc, and Kennelmen, to give him his chance, helps him escape. Then, holed up in an Alaskan lodge, the android begins to transform himself into something horrible—and horribly dangerous. Kennelmen begins to wonder what he has unleashed on the world . . . and at the same time to suspect that Sam is, or has somehow become, God. Whether this is of any more than academic interest depends on your personal beliefs.

I've neglected Koontz, but I'll try not to in future, unless he takes the road of non-science and nonsense.

THE STAINLESS STEEL RAT'S REVENGE

By Harry Harrison • Walker & Co., New York • 1970 • 258 pp. • $4.95

In this one, I'm sorry to say, Harry Harrison is marking time. It's nice to meet Slippery Jim di Griz and his lethal bride again, but he simply isn't the blithely amoral individual he was in "The Stainless Steel Rat"—which Walker has reprinted in hardback, and which *is* a good yarn.

This time our antihero and his pregnant fiancée, Angelina, are rescued from the holiday world where they have been pre-honeymooning and keeping their hand in with assorted—and flamboyant—larceny. The Special Corps, which enlisted him rather forcibly in the earlier adventure, collars him again and sends him off to see why a planet called Cliaand—"aa" presumably as in "aardvark"—is doing the impossible by engaging in interplanetary—indeed, interstellar—war and mopping up planet after planet. He infiltrates as an arms salesman, becomes a garbage collector, and is presently a Flight Major who is promptly busted to Lieutenant and sent to the front as part of another impossible invasion.

It's all good fun, but too much of Slippery Jim's best skulduggery takes place offstage for his exploits to be believable in the way "The Stainless Steel Rat" was. That's the book to read.

THE ANALYTICAL LABORATORY
January 1971

PLACE	TITLE	AUTHOR	POINTS
1.	The Tactics of Mistake (Conclusion)	*Gordon R. Dickson*	1.25
2.	The Telzey Toy	*James H. Schmitz*	2.00
3.	Sprog	*Jack Wodhams*	3.53
4.	The Enemy	*M. R. Anver*	3.72
5.	Homage	*Tak Hallus*	4.25

THE EDITOR

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BRASS TACKS

Dear John:

Your remark in October "Brass Tacks," that 3,000 tons of coal dust aerated by powerful blowers can produce a three kiloton explosion, seemed so obvious once it was pointed out.

After reading it a second time, though, I thought I remembered that explosives are not particularly large energy producers, merely rapid ones. Sure enough, my daughter's chemistry text says "the fission of 1 gram of uranium produces as much energy as the combustion of 5,500 lbs. of coal or the explosion of 33 tons of TNT."

So, surprisingly enough, 3,000 tons of coal dust mixed properly with air (admittedly not easy to do!) would give an explosion equal not to 3 kilotons of TNT, but 36 kilotons. A respectable blast, even by nuclear standards.

JIM LOMASNEY
2501 Waverley St.
Palo Alto, CA 94301

Even at only 10% efficiency it could make a loud bang!

Dear Mr. Campbell:

I was quite happy to see my article on bacteria was published in the November issue; since I wrote the article there have been a couple of developments which might interest your readers.

I overstated my case in discussing bacterial "mining" of metallic ores when I said the process could leach out metals without the expense of regenerating the leaching solution. As a friend of mine pointed out, there is going to be an expense in aerating the solution and seeing to it the bacteria remain alive and happy. It may also be necessary to make sure the water is neutral, or slightly acidic. In an area with alkaline water this may cost a good deal.

But even if the bacterial process turns out to cost more, I think we are going to see a lot of interest in it from the mining companies for one very simple reason.

Smog.

I mentioned in the article what the sulfur fumes from burning high-sul-

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fur coal will do. Roasting sulfide ores produces the same type of fumes in much greater quantity. It is impossible to trap absolutely all of this sulfur dioxide and extremely expensive to trap most of it. Quite a lot of it escapes into the air.

I live in Arizona, the state which produces most of the copper produced in the United States. Mining is a big industry here and some of the state's counties are almost totally dependent on it. We also have something like a half-dozen smelters in Arizona producing copper—and pouring dense white smoke into the air. If you fly over the smelters you can see it running through the valleys like rivers. I have seen photographs taken by Gemini astronauts from three hundred miles out in space and the most conspicious landmark in the state is the plume of smoke from the smelter at the town of Ajo. (The cities are hidden under a blanket of automobile-produced pollution which blends into the desert.)

Quite simply, the people of the state have had it with smelter pollution. The last straw came at the end of 1969 when we had honest-to-goodness smog in Phoenix during the winter tourist season. At that time a rather prominent state legislator came out with the statement that if the smelters couldn't clean up they would have to go. (Mind you, the copper companies' big threat in the debate over air pollution is that the smelters would have to close if the air quality standards were made too strict.)

Right now, the mining companies would dearly love to find a way to smelt ore which doesn't involve air pollution. In fact, if they don't they're going to be out of business within about the next fifteen years.

The other development concerns mercury pollution. A group of Japanese scientists has reportedly isolated a strain of bacteria known as *"Pseudomonas* K-54" which will take mercury out of solution and release it as a gas. (I haven't seen their report so I can't give you any details as to how.) This raises the possibility of cleaning up mercury pollution and reclaiming the mercury. Obviously this will have to be done under controlled conditions at the plants producing mercury. I don't know what the gas those bugs produce is, but it sounds a mite toxic to me.

RICK COOK

Looks like almost anything is biodegradable if you just get the right bugs at work!

Dear John:

One aspect of The Drug Scene you overlooked. Those who get into it have even worse judgment than you described, because in many cases, if not most, they don't even know *what* is in the package.

The pills, capsules, spansules, powders and so forth are red, white, blue, green, yellow, orange, purple

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and all possible combinations. The consumers do not, of course, run lab tests on what they've bought (or accepted as a gift—HA!). Dope is bad enough when it's good, but it really has mind-releasing, spirit-releasing, life-releasing powers when, as I've heard—I'm no chemist—it has been cut with arsenic, rat poison or such. Unhappily, lots of times these things do NOT kill: they put kids into hospitals, for which parents, or society in general, pay. While the rest of us wait for the next generation.

Pot is *comparatively* innocuous, since the merchandise is often made up of stems and seeds liberally mixed with the leaves. If cut, the agent is usually grocery-store oregano. The main problem is that pot is so cheap and easy to obtain. It seems most likely that anti-marijuana laws will go the way of Prohibition, for much the same reasons: a large proportion of the population will be using it.

We can't deny that alcohol is a much worse menace, here and now, simply because of the magnitude of consumption. Social notions make it attractive: "When you're a *man*, you can drink!" and "A gentleman knows how to hold his liquor." As I recall, about 35,000 deaths a year are attributed to drunken driving, and probably millions of injuries. Where does that leave the skilled, careful, non-drinking driver? And passengers? Just as dead or maimed. The booze is, of course, not a mixture of unknown ingredients; it is certified by various inspection agencies as the real thing, of a specified percentage of alcohol. It is sold at a pretty good profit to the manufacturer and the government. Millions or billions of dollars are spent on alcoholic beverages annually. Alcohol, too, messes up the biological computer.

Back to the basic question: Do humans have enough sense to survive as a species? Leaving aside the long view of gigayears and all that, the theme of plenty of s-f has been and can be the tight-rope walk of Man over the abyss of extinction. Putting all our little gray cells together, we have come up with some doozies in the self-destruction line. Undramatically—outside the field of sockozowie fiction—the odds right now seem to be in favor of a very unglorious, very unheroic and indeed, smothering in excrement. No bang.

Your facetious friend who advocated Freedom of Medicine might have had a point, except that drugging is not widespread enough, and not likely to become so. There'll still be plenty of poor-judgment types who are "lucky," who pick alcohol and live long enough to breed, or something else (like pot) not as deadly in the drug line. As you've pointed out often enough, the human is a perversely tough species—so far.

ALBERT MANLEY
4745 S.E. Hawthorne
Portland, Oregon 97215

I understand that strychnine is being added to heroin; it gives more of a

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bang to the user in the first rush.
As to the "lucky" survivors; Nature doesn't care how or why an entity survives—consistently lucky units make a lucky species!

Dear John:

The photograph on the inside back cover of the November 1970 issue of Analog can be accurately and correctly identified by any astute astronautical historian.

It shows the historic attempted launching of the first Polish satellite from Kap Kennedenskiy last year.

Unfortunately, the Titanowicz rocket did not lift off.

But an FAI international record was filed for altitude achieved with an umbilical tower.

There're an awful lot of wires to connect around a launch complex...

G. HARRY STINE

Or that time the "launch tower complex" really was launched?

Dear John:

Your May editorial unfortunately will not reach or impress the people it discusses. It is true that the, uh, "discriminated-against" seem often only to want their rights, not their obligations. It is all very well to say that, "He who has two coats should give away one," but the one who receives such gift might reduce it to unwearable rags with some efficiency and come back whining about the inferiority of the spare.

A particular case in this vein that early in life can dishearten is when toys are outgrown in childhood. Cars and soldiers, carefully maintained cardboard facsimile, and Meccano painfully gleaned through swap and haggle, these things given to "needy" kids can swiftly lose the character imparted to them over fond years, and in very short order, days, sometimes minutes, can become crunched and dispersed and *colorless* strangers, dismembered and dying, the dust of a foreign backyard choking their vitals, becoming a shroud to blend them to oblivion, and so to the termination of their power to assume investiture. And alas to see a cherished bicycle fall into unfeeling hands, to see a mudguard become awry, soon to disappear; the remaining one to cause no concern with its rattle; to see the wheel develop wobble, hear jitterings from general looseness, pedals squeaking, *rust,* and the chain caulked with grime and cagunking desperately with thirst. In a couple months this friend of countless swooping miles and whirling forays is beat-up junk, unsafe at any speed.

Things don't last like they used to—for some people, not even one happy memory. There are those who scorn sentimental attachment to a mechanical article, to a chair, or maybe to a room, or a corner in a garden. But where there is no sentiment there is no care. We all know of the old motor that is unstartable by anyone but its long-time loving owner. It "knows" him. Other people may emulate his procedure,

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but the engine is not so easily tricked. Why?

Well, take my sister's toaster for an example close to home. This is a most pernicketty and selective instrument for doing the favor of crisping bread. My approach has variously and severally been kindly, gentle, firm, casual, respectful, restrained, unrestrained, forceful, threatening and abusive. This gadget has something inside it that when a slice of bread is dropped in it should poise momentarily, then be absorbed without further ado to undergo its partial cremation. But the slice from my hands just sits there. It bounces. My tappings and pushings of encouragement meet persistent sprung resistance. The upper half of the bread is like a cheeky pallid tongue repeatedly poking out at me in determined defiance. Sneak attacks, cajoling, violence, bad language, none of these things make any difference. That toaster spits in my eye.

Then should enter my sister. "You're staring, again," she says, "and dribbling. What's wrong?" And carefully controlling my sneers of disparagement, I give another recounting of the slave's insubordination and obduracy, and make renewed dark urgings defining the decrepitude of its innards, and tender advisings of splendid trade-in offers that it would be wise to consider and accept.

The toaster doesn't scare easily. It knows that loyalty pays. "Hm-m-m," my sister says. She takes the bread from my hands. Ka-klunka! she slaps the slice into the slot. There is something indefinably authoritative in her manner. The blasted machine knows it. It swallows the slice without demur, humble obedient liar, even seems grateful. It makes me so mad. Nowadays, if my sister isn't around, I try to ignore it. And who wants to get into a rut always having browned-off bread for breakfast anyway?

It is noted in *Time* that for women to gain true equality would mean that they would become eligible for the draft. Also in the news lately we've read: of a Miss Nude America competition that's to be held in Indiana; of a judge in California making forty-seven lawyers contesting a $6 million will pin numbers onto themselves so that he might have a chance to keep track; of the Shri-Swami Yogyi Dewan keeping his eyes squeezed tight shut while traveling, so to avoid any close look at women; of the coming passing of the role of meter-readers to computers; of the delightful uninhibiting side-effects of the Parkinson's Disease treatment drug, L-Dopa; of prostitutes here mobilely operating out of accommodatingly equipped furniture vans; of Neapolitan morticians fighting each other to claim the newly deceased in an exceptionally competitive struggle to win business.

Real life sure makes things tough.

JACK WODHAMS

How can you teach the thoughtless-careless to protect property and not make themselves poverty-stricken?

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Dear Mr. Campbell:

I was quite struck by your September editorial, and it set me to thinking. The best way to discredit a movement is, of course, to insure that there are disreputable elements in the movement. And the easiest way to insure disreputable elements is to create them. Keeping this in mind, let's take a look at one particular college—the University of California, Berkeley.

After the Free Speech Movement (which, regardless of what you may have gathered from the media coverage, was not violent-civil disobedience, whatever one may think of it, is distinct from vandalism and rioting—and did not consist of a fight for four-letter words), there was little demonstrating at Cal which garnered media attention, possibly because there was no violence. During this hiatus, the number of "street people," a group of non-self-supporting types congregating near the campus, and not enrolled in the school, grew. Recently, there has been much action, most of it peaceful. However, some demonstrations have degenerated into violence, and the police have broken these up—some contend that the above order is reversed, but for my purposes that is irrelevant. After a certain amount of time for the earnest demonstrators to leave, the police made arrests. The results were interesting; only a small minority of the rioters were students at Cal.

A large number of Cal students have opted for non-violent action. Not that this has eliminated the violence; a large group of street people recently trashed Telegraph Avenue, but did so with no student support. Conclusion? The street people are the lackeys, paid or unpaid, of those who wish to stifle dissent. No writer would presume a group of people stupid enough to act directly against their own movement. But then, this is real life, not a novel, and after all, "Truth is far stranger . . ."

MARK DURST

Culver City, Calif. 90230

"No group of people so stupid as to act directly against" their own interests?

How about heroin addicts?

People do *make wrong choices out of poor thinking, frustrations at not getting immediate results, et cetera.*

Dear Mr. Campbell:

Your "Cliff Hanger" editorial remark: ". . . those, who work hard and thoughtfully toward perfection, are rewarded with good luck above and beyond the direct results of their efforts," reminds me of the frustrated golfer complaining about his successful rival.

Said the frustrated one: "Boy, is he lucky. And I've noticed that the more he practices, the luckier he gets!"

JACK DALBY

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It's very unfair to people who don't want to work that hard, isn't it?

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EDITORIAL

continued from page 7

200 meters of screening water.

At a few more light-years distant, the hard radiation would kill off many species, and cause massive mutations in the survivors, except for the deep-water species that remained protected.

Waves of immense magnetic forces are also generated when a giant star explodes, driving some nine tenths of its mass into space, and imploding the remaining tenth, or so, into a neutron star a few miles in diameter, with pressures so vast that matter attains a density of about fifty trillion grams per cubic centimeter—5×10^{13} g/cc.

It's now known that Earth's magnetic field has been suddenly reversed by some mysterious process a number of times in the planet's history.

It could be that a nearby exploding supernova's wild magnetic field can invert the polarity of Earth's field. If this is so, then the supernova explosion would first flatten Earth's normally protective magnetic field, then ram through a shockwave of high-energy radiation.

We do know that, in a remarkably short period of time, all over the Earth, the great, dominant saurians, who'd ruled the planet for more than a hundred million years, suddenly vanished from the planet, while at the same time, in a seeming wild burst of mutations, mammals appeared and took over the world.

And this, too, indicates that while *an* ecology may be very fragile, *ecology* is not.

The essential point I want to make in this discussion is not that simple point; it has to do with the proper social duty of the scientist—what the scientist owes the society that breeds and supports him.

In essence, while all scientists agree that Truth is his first duty, there's considerable disagreement on Judgment.

There can be an immense difference between a True statement and a Judicious one. Simple example: If a man sees a small bottle of pale yellowish oil, picks it up, and asks the scientist, "Is this stuff poisonous?" the scientist could truthfully say, "Yes, it's quite toxic." "Agh," says the visitor, "throw it away! I hate poisons!" and tosses it into the sink.

The scientist's statement was true; nitroglycerine *is* poisonous. It also has other properties, however, which he neglected to mention.

Not being God Almighty, no man can tell "the Truth, the whole Truth, and nothing but the Truth." But failure to explain the whole truth-as-he-can-determine-it is as vicious a form of lying as there is.

However . . . part of any genuine truth is competent judgment. To give a man data which is all true, and as complete as possible, can be a deliberate, deadly trap—when you know that man is incapable of evaluating the data.

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Men have (are now, and will henceforth!) sought to gain personal advantages for pet theories, for their own Cause, or for political power, by feeding out misweighted facts, knowing that untrained men will form false conclusions from those facts.

On top of that, men will listen attentatively to data that matches their current wishes—and ignore, or brush off data that would deny their desires.

The current ecological problems are a prime example. It's impossible to discuss the matter in full detail in the mere 178 pages of this magazine—let alone the few used for editorial comments—so I'll cite a major example of the problem, and let you consider the general class.

Thermal pollution of the environment does exist; this is a truth. There is some degree of risk that a major accident in a nuclear power plant could release some dangerous degree of radiation. All fossile fuel plants release quantities of carbon dioxide and water vapor; some also release carbon monoxide, hydrocarbon remnants and nitrogen oxides. Most also release quantities of sulfur dioxide.

Those facts are truths. What to do about them is going to be a matter of judgment and evaluation. The simplistic answer would, of course, be "Shut down power plants of all kinds, and eliminate that pollution!"

Except, of course, we don't want our supply of electricity cut off. And since our automobiles are so necessary to our freedom to pursue happiness, we can't give up *those* power plants. And while there's certainly a risk in driving around at 60-80 miles an hour, don't consider imposing and enforcing a really *safe* speed limit of 10 miles an hour, so that nobody will be killed or maimed. (As a General Motors executive said when testifying before Congress, they *do* make a completely safe vehicle, which they sell regularly to the Army—which calls it a tank.)

The social duty of the scientist is not merely that of reporting facts, but of adding the *probable meaning of those facts.*

It is his social duty to report not merely facts, but to evaluate them as honestly as he can, and bring the factors to be judged into sight as well as the facts to be judged.

One of those factors is that human life is not sacred—and no human being really believes it is. *Including his own!*

If you truly believed human life, to wit your own, or that of your wife and children, was sacrosanct, you'd never drive an automobile on the highway.

I'm now talking in the irrational, absolutistic terms implied by "human life is sacred." Either it is so sacred we must never risk it at all—or it simply has a high value, not to be risked for trivial cause. In which case you do not truly believe that life is sacred.

Highway statistics clearly demon-

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strate that we do not regard life as sacred, whatever we may say. The high incidence of death among drug addicts, and the continuing supply of brand-new addicts, also demonstrate that people don't consider their own lives sacrosanct.

Tried sky-diving as a sport? Automobile and motorbike racing?

Therefore, the fact that a particular installation might have some possibility of causing deaths is a factor in evaluation—but it must be compared with the probability-of-death-or-injury factor in other things of similar utility. If a thing is as useful as the automobile, evidently we can tolerate a high death rate, and a very high pollution effect.

Let's be honest in our evaluations, and stop being fanatics! Any fanatic anti-pollutionist who arrives at a demonstration, protest meeting, or discussion by automobile or motorbike is open to challenge that he's a hypocrite; he polluted his way there. If he's shouting that power plants should be stopped—let's stop the one he's using.

Incidentally, most people neglect to consider just how much of a private power plant they're actually using to get down to the grocery store, or the local nightspot. Mine happens to rate about 300 kilowatts; even the smallest compacts run about 50 kilowatts. The ordinary new, well-supplied modern home, with electric stove, clothes dryer, and air conditioning has at most a 200 ampere, 220 volt circuit—less power is required, even at peak load, than a Volkswagen engine generates. Modern high-performance cars have power plants that could readily supply power for twenty suburban homes.

When you brake your modern heavy sedan from 60 miles per hour to rest, the heat generated in the brakes would be sufficient to keep a modern six-room house warm in 10° weather for about three-quarters of an hour.

Being honest in thought and judgment means evaluating all the facts available—not just the ones that point the way you want to believe!

If automobiles are tolerable as useful instruments of modern life, despite their high risk-rate, and their huge pollution—then certainly the minute risk of nuclear radiation *if* some major catastrophe *should* crack the reactor's containment shell, must be considered far more acceptable.

Of course the general public still has the vague belief that a nuclear reactor may explode like an atomic bomb and wipe out a whole city.

Just remember that TNT is made from coal, and that must mean—by the same kind of thinking—that coal piles are full of TNT and can explode at any moment.*

The fact is that nuclear reactors absolutely can not explode; achieving a nuclear explosion requires the

* I wonder if I'll wind up seeing that statement quoted out of context as saying I think coal piles are terribly dangerous?

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most elaborate precision arrangements of super-purified materials assembled in precisely the right way. The absolute worst that even a fast-neutron breeder reactor could achieve would be a sudden slag-down—wild nuclear reactions producing heat so much faster than it could escape that the materials of the reactor melt into an incandescent puddle. The moment that happened, of course, the carefully aligned and arranged reactor elements would be thrown together in a mess—stopping the nuclear reaction in the following nanosecond or so.

The nuclear containment vessels are so designed that a Force 10 earthquake would serve to bounce them around a bit, scrambling the reactor inside pretty thoroughly, and putting it out of action thereby. The inhabitants of the city it served wouldn't mind though; a Force 10 earthquake doesn't leave any city to worry about.

Finally, this matter of thermal pollution.

This one is one of those wild Truths, like a one-eyed Jack in one form of poker. True; nuclear power plants throw large quantities of heat into the environment. True; this can make a stream too warm for the fishy natives to endure. BUT—there are Arctic Char living in the rivers of northern Alaska and Canada that can't possibly tolerate the scalding hot waters of the Mississippi, or even the hot streams of Montana or Colorado. They're *arctic* fish; if water gets appreciably above the freezing point, their metabolism can't maintain control of its enzymes—those enzymes are specially evolved, hyperactive molecules designed to keep the fish running at full blast in water at O°C. Naturally our normal room temperature is completely intolerable.

But, if an atomic power plant were built on one of those arctic streams, and raised the water temperature 15°C, that would *not* mean that *no* fish could live in it—simply that the previous group of fish would be displaced, and other breeds that needed those warmer waters would replace them.

When the Yankee Nuclear Power Plant was built on the Connecticut River a few years ago, very elaborate ecological studies were made of the result. The power plant takes water into a side canal, uses it to cool their condensers, then returns it to the river via another canal.

When the ecology had stabilized to the new conditions—some breeds of predatory fish were swimming up the discharge canal to feast on some smaller fish that just delighted in the warmer water. The predators couldn't actually stand the warmer water, but they were so busy gorging themselves on the supply of smaller fish they didn't seem to notice it had a tendency to kill them.

They're currently—quite unintentionally!—in the process of selectively breeding a new line that

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will be adapted to the rich diet, and the higher temperature.

Look, friends—if ecology managed to survive the catastrophic pollution of the photosynthetic plants, the upheavals of three billion years of lava flows, mountain building, volcanic sulfur dioxide and carbon dioxide pollution, and all that's gone on during Earth's more than mildly turbulent history—you can't really believe that a little heat leaking from a tiny little man-made nuclear reactor is going to seriously disturb it, can you?

Oh, sure—it'll lead to the destruction of many species, the elimination from whole areas of familiar forms. So what? That's new, maybe?

Why not mourn the passing of rattlesnakes from Manhattan Island, and the loss of wolves from Europe?

On the other hand, the coyote, by sheer power of brains, agility, and endurance has *extended* its range which was originally limited to the West, until it is becoming fairly common in the Eastern states. Extended in the face of Man's Western migration.

Certainly there are ecological problems. It's a shame that many bird species have been unnecessarily endangered—or even made extinct—by DDT. But some of the species are, like the insects before them, developing DDT-immune strains.

Remember that *an* ecology can collapse; they have a hundred times over on this turbulent planet. But *ecology* survives. Just a different set of organisms that, in the altered conditions, has a new advantage and takes over the stage of life.

It is the proper duty of scientists who study this area of Truths to evaluate and report honest, clear, straight judgments to the public—because the public is, quite obviously, incapable of making rational judgments without that assistance.

Unfortunately, it's ever so much easier for crackpots and fanatics to get their message across. Only crackpots and fanatics have clear, simple, yes-no answers that have a good, satisfying ring of "This is The Answer!" about them.

It takes a fanatic to come up with a simple answer to a complex, multifaceted problem. And simple answers are so much easier to cling to than those slippery, hard-to use complex answers to difficult problems.

Now if you want a good, clear-cut, simple answer to the problem of pollution caused by power plants, there's an answer as simple as the answer to nuclear weapons. "Ban The Bomb" is about as useful as "Ban All Power Plants"—including automobile engines, of course.

You'll agree that that would practically eliminate air pollution and thermal pollution. It would solve the Farm Problem, too; farmers would be so busy raising horses and mules, and food for them, and fighting off starving ex-city dwellers who couldn't get food shipped in that there'd be no more Farm Problem.

It's all those damn side effects that make things so frustratingly difficult.

The Editor.

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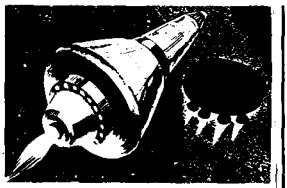

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